Paper Trade Journal

Vol. LXXVI. No. 18 NEW YORK AND CHICAGO, APRIL 27, 1923 Price 15 Cents

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PAPER TRADE JOURNAL

The International Weekly of the Paper and Pulp Industry and the Pioneer Publication in its field

FIFTY-FIRST YEAR

Published Every Thursday by the

LOCKWOOD TRADE JOURNAL COMPANY, Inc.

LESLIE R. PALMER, President — J. W. VAN GORDON, Vice-President

Telephone: 2380 Vanderbilt — 10 EAST 39th ST, N. Y., U. S. A. — Cable Address: Catchow, New York

Western Publication Office—431 S. Dearborn Street, Chicago
New England Office—Room 46, 127 Federal Street, Boston
Washington Office—L. M. Lamm, 63 Home Life Bldg.
London Office—Stonhill & Gillis, 58 Shoe Lane

MEMBER OF THE A. B. C.

Terms of Subscription

UNITED STATES AND MEXICO ..... Per year, $4
CANADA AND FOREIGN COUNTRIES IN POSTAL UNION ..... Per year, $6
SINGLE COPIES ..... 10 cents

Other Publications of Lockwood Trade Journal Company, Inc.

AMERICAN STATIONER AND OFFICE OUTFITTER (Weekly) ..... Per year, $3
LOCKWOOD'S DIRECTORY OF THE PAPER STATIONERY AND ALLIED TRADES (Annual) ..... Per copy $7

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CHEMICALS FOR THE PULP AND PAPER INDUSTRY

PAPER INDUSTRY RETURNS TO NORMAL

Steady Gains in Pulp, Paper and Allied Industries Characterize the Past Year

While Many Production Records Were Shattered in 1922, It Has Been One of Steady Progress and Industrial Reconstruction Rather Than a Boom Year—The Paper Industry Has Been Confronted with Innumerable Economic Difficulties but the Strides Forward in Spite of Them Attest to the Expansion which Took Place—A Review of Paper, Pulp, Paper Stock and Chemical Markets for the Past Year.

Written Especially for the Annual Number of the Paper Trade Journal by Hal F. Lee

The past year has, in every sense of the word, proved a most fruitful one for pulp and paper stock men the country over. Since the time of the last spring convention of the American Paper and Pulp Association, the general undertone of the market has steadily firmed and this movement has been attended by a gradual strengthening in prices. The first quarter of 1922 brought with it a reaction from the widespread depression which enveloped the trade in the latter part of 1921 when prices careened downward and "the bottom dropped out of the market."

The three months preceding the spring convention were, in consequence, largely devoted to a resurrection of values and a stabilizing of prices in badly deflated markets. Both coarse and fine papers were encompassed in this movement and mills were restricted to a production averaging not more than 50 per cent to 60 per cent of normal. By April conditions had ameliorated to such an extent and the former hand-to-mouth demand had given place to one of such immeasurably firmer quality that hopeful predictions were made when paper and pulp manufacturers convened to lay plans for the ensuing year—the year that has just passed. The months of April, May and June showed satisfactory progress in practically every line, but business was still in a state of rehabilitation. By the time the industry had once again gotten into full swing, it was beset by the usual period of summer quietude, inventory taking and slack production at the mills.

Following close on the heels of this, the Nation found itself in the throes of a widespread coal strike and transportation tieup. The result of these was to retard further what progress had been instituted in the paper industry and consumption was materially depleted during a period when expansion normally should have been at its peak.

By October these industrial difficulties had been brought to a close and a stronger feeling began to manifest itself in the various markets for finished paper as well as in those of raw materials. During this month, the first substantial price advances of the year occurred placing various paper and pulp items on a firm basis and admitting of a fair profit to both manufacturer and dealer. Continued high prices in the raw material markets played their part in sustaining the firm tone that accrued to the market for finished paper during the balance of the fall and in the first few months of the winter.

Impetus Carried Into 1923

The impetus thus gained in the paper and allied industries was carried practically unbroken into the present year with the exception of the seasonal depression during the three weeks at the close of the year. Starting early in January a brisk activity developed and has continued to increase in intensity until the present. The pulp markets have been especially active since the Christmas holidays at which time they appeared to be on the brink of severe price recessions.

Shortly after the first of the year the first Swedish pulp mills were shut down owing to the workmen's strike. This lockout extended rapidly until by the latter part of the month the entire nation—the world's second largest producer of chemical pulp—was entirely crippled by a tieup which extended to every paper and pulp mill and involved nearly 40,000 workmen in the allied industries. Since that time the paper workers of Sweden have returned under a year's agreement, but at the present writing the outlook for a reconciliation of the mill owners and pulp employees is extremely doubtful.

Four Retarding Factors

In the main there have been approximately four drawbacks to capacity activity in the various paper and pulp fields, namely tariff uncertainties, transportation difficulties, including car shortage and embargoes, fuel scarcity, and labor troubles. Following the amicable settlement of the news print strike shortly after the last April Convention, there were no lockouts of serious consequence in these industries themselves, but strikes in allied industries, such as the textile, garment workers, boot and shoe industries played their part in retarding consumption of finished paper.

The coal situation has been one which has occupied the center of the stage insofar as paper and pulp manufacturers are concerned ever since the close of summer of 1922. In a few exceptional cases, mills were closed down due to the acute shortage of fuel and the majority of paper and pulp mills were, at some time during the coal miners' strike, restricted to less than capacity production. The fact that considerable quantities of English coal were imported to this country to make up the deficit had no little bearing on trans-Atlantic freights and frequently many English and American bottoms were devoted to the carrying of British coal where they had hitherto been utilized for the transportation of China clay, old rope, bagging and other paper making materials. This in consequence had the effect of temporarily decreasing the imports of such commodities, making for a shortage in the domestic market and subsequent firmer prices.

The lowering of freight rates last July was welcomed by practically all branches of the industry and producers and dealers were unanimous in the belief that with the close of the summer period an era of prosperity and capacity production would be ushered in. The unfortunate prolongation of a strike on many of the large railroads during the fall months postponed this boom period to a certain extent, but after the settlement was reached in October consignments were sent forward in such volume that the railroads seemed hardly able to cope with them. A serious shortage of freight cars developed almost simultaneously with the resumption of

activity along the various lines and the roads were further hampered by an unusually strenuous winter.

News Print Breaks All Records

The combined news print production of 2,540,000 tons shattered all previous records for the U. S. and Canada combined and this amount was 140,000 tons in excess of the previous banner year of 1920. Canadian production during the past year was 34 per cent more than that of 1921 and more than 80 per cent of Canada's entire output was marketed in the U. S. The U. S. in 1922 produced 1,448,000 tons of news print paper or 223,000 tons more than the year before. Adding the production of Newfoundland of 60,000 and that of Mexico, 10,000 tons, a total of more than 2,600,00 tons is reached for the entire United American continent. This production averaged 16 per cent higher than 1921 and twelve per cent higher than the former high year of 1920.

In evidence of the demand which prevailed at the close of 1922, stocks on hand at news print mills at this time were only equal to about three days average production. Shipments to mills during the year more than kept up with the greatly augmented output. The per capita consumption of news print during the past year was 44 pounds, or the equivalent of all the rest of the world combined. Some idea of the tremendous strides which this industry has made in the past generation may be gained when it is observed that the per capita consumption of news print in 1900 was but 15 pounds.

The outstanding reasons for the expansion in news print output during the past year were the enormous increases in advertising and the exceptionally large sizes of daily and Sunday issues of newspapers. The total amount of advertising in this country during the year was in the neighborhood of $800,000,000 and 7/8ths of this load was carried by newspapers. It is predicted by statisticians as well as those actively engaged in the industry that the billion dollar mark is not far in the future. As with other branches of the paper industry, newsprint producers have been seriously crippled throughout the year by the car shortage, fuel scarcity and in recent months by a paucity of mechanical pulp. In the course of a few weeks beginning shortly before the Christmas holidays, the ground wood market assumed a very bullish aspect as a result of this shortage and prices jumped from the neighborhood of $30 per ton to $50 and higher by the middle of February. Since that time more plentiful rains in grinding regions have enabled producers to increase their output and news print mills are again working on a full rate basis. The outlook for the balance of the year in this industry is an exceedingly bright one and manufacturers all agree that fundamental conditions were never better for a year of continued expansion and unlimited progress.

Fine Papers Show Steady Gains

Manufacturers of fine paper began the past year under unsettled conditions and were confronted at the outset with declines in prices as well as an uncertain, hand-to-mouth tendency at the buying end of the line. Exports at this season were almost a negligible quantity and the spotty home demand held producers to an output that seldom taxed the mills more than 50 per cent to 60 per cent of their capacity. Conditions gradually grew better as the year wore along and with the exception of the seasonal quietude during the summer months and the economic turmoil of the early fall when coal was exceedingly scarce and shipments of both raw material and finished product were delayed owing to the rail strike, the year may be characterized as one of slow but steady progress. By October the period of peak production was reached in fine papers and this was continued over the year end. January, according to recent statistics, was the best month for fine papers in the last five years. While complete data is not yet available, it is not far amiss to venture that the first quarter of 1923 will prove to be the most lucrative first quarter that fine paper men have ever experienced.

The production and demand for all grades of fine paper during the months of February and March of this year are both above normal and do not fall far short of the peak which was reached early in 1920. During the course of the past year, production fell off from the preceding months' total at four different times. In February, April and July, these depressions were wholly seasonal and in September the decrease may be attributed to the transportation and coal tieups. It is interesting to note, however, that after each successive recession production established a new high mark for the year.

Tissues Have Regular Call

The course of the tissue market in the past twelve months has been, in the main, moulded by a variety of external influences, ranging from a shortage of ground wood to strikes among garment workers and other large consumers. A fairly regular call has existed throughout the year on nearly every grade. No. 1 white has remained in the strongest demand, but the consumption of colored, anti-tarnish, kraft and Manila tissues has been unusually heavy.

Perhaps in no preceding year have tissue manufacturers been confronted with such a wide variety of obstacles. Raw materials have been consistently high in price and frequently difficult to obtain in adequate quantity. Producers have been successively faced with a shortage of coal, freight car congestion and, in recent months, a scarcity of mechanical pulp. This last item at one time threatened to hamper operations seriously and several mills were on the verge of closing down. Peak production in the tissue industry for the past year came at the close of the coal and rail strikes and mills have been approximating capacity output since that time, with the exception of the seasonal lull around the Christmas holidays. Manufacturers have been fortunate throughout the year in securing scrap bagging, at relatively low prices, owing to the fact that bagging of all grades was practically a drug on the market. Dealers believe present quotations proportionally too low and predictions of a higher scale of prices are not infrequent, despite the easier tone which has prevailed in the ground wood market of late.

Book Paper in Strong Position

Recuperating in gradual but steady strides from the general depression which existed throughout 1921, book paper last year gained persistently both in demand and production. At the beginning of last year, and up until the time of the Spring convention of the American Paper and Pulp Association, book paper mills were operating at about four-fifths of their capacity, demand was irregular and the prevailing market prices scarcely admitted of a profit. This was a distinct gain, however, over the corresponding period in 1921 when manufacturers were forced to shut down to a half-time operating basis.

From April, 1922, until October, prices remained relatively firm and despite the usual summer depression, the coal strike and the transportation tieup, the market registered distinct gains in undertone. Perhaps the most conspicuous turning point of the year came in October when prices of machine finished and sized and supercalendered book were advanced approximately 4 per cent and the better grades correspondingly higher. These advances were necessitated by high raw material costs in practically every line and were attended by a strong demand from the consuming trade.

The general industrial boom which followed in the wake of the coal and rail strike settlements brought with it a tremendous increase in magazine advertising and this was reflected in the heavy inroads which were made on book paper stocks. From last October until March of this year, producers were kept operating to capacity, economic conditions were greatly improved, and book exports increased sharply.

Board Is Active in 1922

The total production of board in 1922, 2,153,835 tons, vary, according to the figures of the Federal Trade Commission, nearly

reached that of the previous record-breaking year of 1920, when an output of 2,313,449 tons was recorded. Starting in January with the comparatively low production of 145,000 tons, board manufacture increased steadily in volume, month by month, until in September the high mark of nearly 200,000 tons was reached. The stimulus of spring buying last year considerably increased the extent of manufacturing, but after the month of March, there was a noticeable falling off until the summer quietude had passed away. August, September, October and November, 1922 were all record months, more than 195,000 tons being produced in each, while unsettled conditions in the pulp markets in early December, combined with the usual holiday dullness, served to bring this average down to 185,000. Stocks on hand at the mills at the close of the year hardly totaled more than a week's average production.

At the present time it is the firm belief of board men that the industry is in for a long period of sound development, good business and firm prices. Within the last two months, the various board grades, led by news, straw and chip, have fluctuated considerably, varying as much as $10 to $15 per ton in the short space of ten days or two weeks. High waste paper prices during the last half of 1922, combined with a growing firmness in the pulp markets, have served to give boards a strong tone at the producing end, and manufacturers now aver that the industry is in the best shape it has been in for several years.

Wrapping Paper Makes New High Mark

Domestic production of kraft paper broke all previous records in 1922, even surpassing the former peak year of 1920 by approximately 5,000 tons. The new high production figure, according to the Federal Trade Commission, is 836,271 tons. This is nearly 200,000 tons more than was produced in 1921. Toward the close of the year, imports began to decline, but stocks on hand December 31, 1922 amounted to nearly one month's average production of the United States' mills.

Wrappings of all descriptions have grown steadily in demand throughout the year and prices firmed slightly but, for the most part, held very steady. Following the dumping investigations last spring and the revised import duty under the new Fordney-McCumber Tariff Act, the influx of Scandinavian and European kraft was checked to a certain extent. Several importers found it hazardous to bring in the commodity owing to the fact that the home market price at the time of shipment was often considerably at variance with the price at the time of shipment. This fact resulted in a number of undervaluation hearings by the customs officials of this country, and the delays and expense thus brought about boosted the cost of the merchandise to a point where it was frequently unprofitable to handle. The effect of this, however, was to stimulate the consumption of domestic wrappings and create a stronger market for the home product. It is the belief of both manufacturers and dealers that the balance of 1923 will be replete with sound business for the wrapping paper industry and from present indications another record will be established.

Mechanical Pulp in the Limelight

Perhaps more than any other individual item in the pulp, paper or allied industries, ground wood has remained almost continuously in the limelight during most of the year past. With the exception of 1920, last year's production of 1,481,935 tons was the highest on record, but the enormous strides made in the news print, board, tissue, and other paper lines consuming heavy quantities of mechanical pulp, made it appear as though a constant shortage of this all-important raw material prevailed. Shortly after the last spring convention of the American Paper and Pulp Association grinders began to report restricted production owing to a lack of water. During the unusually dry summer which followed this condition was further aggravated. By the time fall rains relieved grinding conditions the nation found itself in the throes of a widespread rail strike and facing an acute coal shortage. Some surplus accumulated during this period, but during the boom which followed stocks on hand were reduced to a minimum. Shipments were made as fast as freight cars could be secured. By the close of the year there were but 66,000 tons on hand, approximately half the amount on hand at the close of 1921.

In point of price ground wood has been especially active. Dropping from the high point reached in 1921 to the low of approximately $28 to $30 per ton, for fresh ground spruce, f. o. b., New York soon after the beginning of 1922, mechanical pulp remained in this vicinity for the balance of the spring and early summer, when it began to edge upward slowly in keeping with the water scarcity at grinding points. In the fall, however, coincident with the boom which extended to practically every phase of the paper industry, ground wood evinced an exceptionally firm tone. With the first freeze-ups of the past winter, prices fairly soared. Not until the $50 mark was touched did they pause in their upward movement. Any number of sales for spot shipment were recorded at prices from $52 to $55 per ton during parts of January and February of this year. Last month, however, the first declines were apparent and the present quoted price is in the neighborhood of $40. Spring thaws are providing grinders with more water and production is again on a capacity basis.

A succession of trivial ups and downs has marked the price course of the ground wood market during the year. Mechanical pulp and waste papers have alternately been in the ascendant and a fairly even balance of power maintained between these two raw materials. The strength of the chemical pulp market, as a result of the prolonged Swedish lockout, is now exerting a bullish effect on ground wood, and should prove an important factor in preventing the recession of prices in mechanical pulps even after grinding conditions return to normal. The prosperity of the news print industry, the chief consumer of ground wood, augurs well for a continuance of the healthy expansion which this market has enjoyed in the last twelve months.

Chemical Pulps Enjoy Steady Demand

Pulps of all grades were in steady demand throughout the past year and the record made by producers was second only to the boom year of 1920. According to the Federal Trade Commission, 3,464,258 tons were produced, including 720,103 tons of news sulphite, 477,187 tons of bleached sulphite, 59,950 tons of easy bleaching, 74,451 tons of Mitscherlich, 256,107 tons of sulphate pulp, and 383,055 tons of soda pulp.

Following the 1921 price drops, prices settled down last spring to an average which was maintained, with fair consistency, for the balance of the year. A gradual strengthening in the undertone of the market was noted and by October producers were operating at capacity. During December the market weakened noticeably and prices fell off to a limited extent, only to be reinforced soon after the first of this year when the report of a strike of pulp workers in Sweden first reached this country.

The first quarter of 1923 has abounded with good business for pulp manufacturers and dealers and the tone of the market has continued to grow stronger. The full effect of the Swedish tieup, which has now lasted some three months, has not yet reached the industry in this country, but dealers feel safe in predicting that mid-spring prices will reflect the shortage which has become so pronounced in Scandinavia.

Paper Stock Has Good Year

Old papers have been by far the most active among the various grades of paper stock and prices, several times during the year, ran practically the whole gamut of tendencies from boom to panic. This market has been particularly sensitive to the status of the demand for mechanical pulp, the extent of collections on hand, and, above all, to freight embargoes and transportation tieups. Almost every conceivable outside influence has been exerted on this market

at some time during the year, for better or for worse and periods of depression and exaltation have followed each other in dizzy succession. The higher grades of waste paper remained relatively more stable owing to their facility for storage, but the action of the board-making grades and other cheaper qualities hinged upon the demand of the moment.

At present waste papers appear to be recovering from what dealers describe as a malignantly "bearish" drive on the part of mill consumers to force prices to an equitable level. On the last upward surge, mixed papers rose to 1.50 cents a pound, which was the crest of the price wave on this item for the year, and then sloughed back to 1.10 and 1.15. The outlook at present, in the estimation of dealers and packers is quite bright in view of the fact that paper mills have orders on hand that will require steady purchases for the next sixty to ninety days at least.

Old rope has kept an even keel during the better part of the past year, and since fall prices have advanced conspicuously. The call for No. 1 Manila is entirely satisfactory, dealers say, and promises to grow stronger as the year progresses.

Bagging, on the other hand, has been rather a dull item until quite recently. Limited amounts of scrap have been moving to paper mills, but the demand throughout the year 1922 was chiefly of a hand-to-mouth type and the handling of this commodity at the prices offered was none too remunerative. From present evidences, however, bagging is regaining its foothold and stronger prices are predicted for the near future.

A steady call for papermaking rags characterized the last half of 1922 and this steadiness has been supplemented by increased signs of strength since the beginning of the present year. Embargoes abroad, restricting the export of foreign rags, have served to advance prices in the United States markets and the substantial increase in demand of late bodes well for the steady expansion of this industry for the balance of the year.

Papermaking Chemicals in Strong Demand

The past year was one of distinct ups and downs in the markets for papermaking chemicals. At the beginning of 1922 the bulk of producers were either operating at a loss or at an even break, and this condition prevailed for the first two or three months. Unlike the paper industry, the chemical trade made the greatest advances during the summer months by an unusual coincidence. Paper manufacturers began to run short of raw materials with the approach of summer, but facing the customary months of seasonal dullness they were loath to stock up heavily in chemicals—more especially those of a perishable nature. Chemical production had reached a very low ebb, and as business showed signs of enlivening toward the close of summer, consumers found themselves short of supplies and came into the market en masse.

From this time on, prices gradually strengthened and increased consumption was attended by slightly lower freight rates and improved transportation facilities up until the time of the railroad tie-up. When this came, producers faced several months of congestion, delayed routings and long overdue commitments. Even after the strike had been settled, the roads appeared to be in a badly crippled condition and almost wholly unable to contend with the flood of traffic that flooded them. The equipment had deteriorated to a great extent and the poor condition of the rolling stock as well as the scarcity of available freight cars proved no small obstacle to chemical producers.

From the end of the summer, however, prices gradually firmed up and with the greatly increased demand of the fall months capacity production was again reached for the first time in nearly a year.

From April to April, bleaching powder advanced 15 cents per 100 pounds in price, sulphate of alumina declined slightly, casein more than doubled in cost, and soda ash and caustic soda remained practically unchanged. Slack acid production had the effect throughout the latter part of the year, of making saltcake quite scarce, and a heavy demand prevailed from the glass and dye-stuff industries. This shortage, it is believed in the trade, will continue for the balance of the current year.

Casein Shortage Acute

Casein has figured most prominently of all the ingredients used in paper manufacturing, and following the ad valorem duty of four cents a pound under the new tariff, this commodity rose spectacularly from its quiet berth of 10 cents a pound to prices which were often more than 100 per cent higher. The protracted dry season in the Argentine has greatly restricted exports of this commodity to the United States. On top of this, the demands of coated paper manufacturers have seldom been heavier, and the combination of these two circumstances has made this market essentially bullish for the past half year. For a time domestic dealers were unable to secure quantities of the milk-product at any figure despite the bids of 25 cents a pound and better from panic-stricken consumers. Hide glue was experimented with in many mills and was frequently substituted for casein in tub sizing and coating. The latter was generally obtainable throughout the year at prices ranging from 13 to 20 cents a pound depending upon the consistency required. During the past month, however the situation has alleviated materially. Argentine's flush milk season is at hand and the increased volume of imports is having the effect of softening the rigorous prices which have prevailed in the American market since the imposition of the duty. It is generally felt that with the coming of warmer weather the undoubted increases in domestic production of lactarine will go far in relieving the shortage in the United States and easier prices are anticipated.

China clay held in consistently steady demand throughout the year and since October the market has been exceptionally firm. Sulphur maintained a steady listing of $18 to $20 per ton throughout the year, and talc did not swerve materially from its current quoted price. Satin white and blanc fixe showed a regular demand, while liquid chlorine, through its materially increased use by paper manufacturers, firmed steadily during the past eight months. Papermakers' grades of rosin,.E, F and G, were subject to several seasonal price alterations, and are now on the incline owing to restricted naval store production at this season. Starch has enjoyed a steady, regular deal during most of the year and the increased activity in book and fine paper mills has added considerably to the consumption of this commodity.

On the whole, the outlook for chemicals and other ingredients used in paper manufacture for the balance of 1923 is an unusually bright one. Mills are booked up with contracts covering the next 3 to 4 months and the demand for finished paper shows no signs of diminution. It may be reasonably expected that chemical manufacturers will enjoy a capacity business from the paper industry for some time to come.

Conclusion

All in all, the past year has been one of most satisfactory progress and industrial reconstruction. It has not been a boom year nor has it been attended by the artificial attributes of a boom. Though production records were shattered in many lines, this came as a result of a steady, substantial demand, and for this reason it may well be counted one of the most beneficial periods of advancement which the paper and allied industries have ever enjoyed.

NORWEGIAN PAPER EXPORTS GROW

A report which has just been received by the Department of Commerce states that the statistics of Norwegian foreign trade show that exports of paper during the year 1922 were valued at $43,968,500, which is four times the value of paper exported in 1921, which amounted only to $9,834,546.

Record Breaking Year in News Print

Total Production in 1922 for United States and Canada Surpasses by About 140,000 Tons the Previous High Mark of Nearly 2,400,000 Tons in 1920—With the Production of 60,000 Tons in Newfoundland and About 10,000 in Mexico the Production on the North American Continent Totalled 2,600,000 Tons —New Machines to Start Soon Will Have Capacity of 700 Tons Daily—Home Industry Self Sufficing.

Written Especially for the Annual Number of the Paper Trade Journal by R. S. Kellogg, Secretary, News Print Service Bureau, New York.

The production of news print paper in North America hung up a new record in 1922, the total for the United States and Canada surpassing by some 140,000 tons the previous high mark of nearly 2,400,000 tons in 1920.

Of this total the United States produced 1,448,000 tons or 223,000 tons more than in 1921 when the output was reduced by prolonged strikes and also more than any previous year except 1920 when the total was 1,512,000 tons. In 1920, however, the product of the regular news print mills in the United States was supplemented by perhaps 80,000 tons from the so-called marginal mills, which did not contribute so heavily to the news print supply in 1922.

The rapid development of news print manufacture in Canada is strikingly shown by the fact that the output last year was 1,082,000 tons or over 200,000 tons more than the 1920 record of 876,000 tons and 34 per cent more than in 1921. More than 80 per cent of the news print paper made in Canada last year was marketed in the United States.

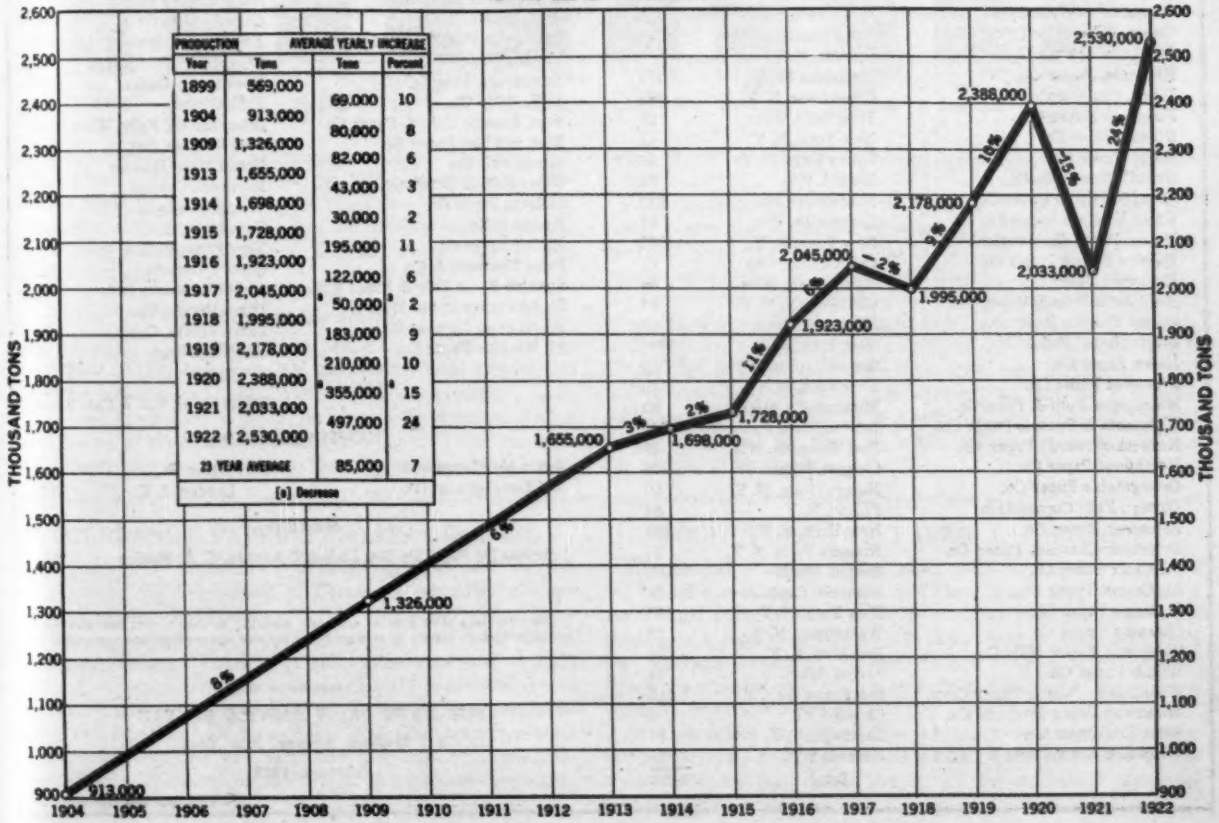
2,600,000 Tons Produced in North America

In addition to these totals for the United States and Canada, 60,000 tons of news print was produced in Newfoundland and probably about 10,000 tons in the one mill in Mexico which makes news print, thus giving a production of 2,600,000 tons for the North American Continent.

NEWS PRINT PRODUCTION
U. S. AND CANADA

PRODUCTION		AVERAGE YEARLY INCREASE	
Year	Tons	Tons	Percent
1899	569,000		
1904	913,000	69,000	10
1909	1,326,000	80,000	8
1913	1,655,000	82,000	6
1914	1,698,000	43,000	3
1915	1,728,000	30,000	2
1916	1,923,000	195,000	11
1917	2,045,000	122,000	6
1918	1,995,000	(a) 50,000	(a) 2
1919	2,178,000	183,000	9
1920	2,388,000	210,000	10
1921	2,033,000	(a) 355,000	(a) 15
1922	2,530,000	497,000	24
23 YEAR AVERAGE		85,000	7

(a) Decrease



Shipments from the mills during 1922 more than kept pace with the increased output, and while mill stocks are never large, the total at the end of the year was 11,000 tons less than at the beginning and equivalent to only about three days' production.

The accompanying charts illustrate graphically and much more clearly than figures, the development of news print manufacturing in the United States and Canada. It is particularly noteworthy that the increase in output during the last twenty-three years is equivalent to a compound interest rate of 7 per cent.

Record-Breaking News Print Consumption

As the production figures suggest, the consumption of news print paper in the United States reached a new high record in 1922. In round numbers it was 19 per cent more than in 1921 and 16 per cent more than during the previous record breaking year of 1920. Publishers who report their monthly tonnage to the Federal Trade Commission and who use a large proportion of the total output exceeded their 1920 consumption by 14 per cent, the 1919 consumption by 22 per cent, and the 1918 consumption by 55 per cent. Publishers' stocks of white paper at the end of 1922 were equivalent to thirty-six days' supply at the current rate of consumption.

Imports May Decline

Imports of news print paper from Europe totaled 133,000 tons in 1922 compared with 135,000 tons in 1921 and indications are that a smaller tonnage of overseas paper will come to our shores in 1923. Of the news print paper coming to the United States from Europe in 1922, Sweden supplied 39 per cent, Germany 25 per cent, Finland 20 per cent and Norway 13 per cent.

Adding imports to domestic production and deducting exports there was not less than 45 pounds per capita of news print paper available for consumption in the United States in 1922 compared with 15 pounds in 1900.

Advertising An Important Factor

Advertising was an important factor in determining the quantity of news print used in 1922, but still more influential was the large sizes of the daily and Sunday issues and the growth in circulation. There are between 60 and 70 newspapers in the United States each having a circulation in excess of 100,000 copies. During 1920 and 1921 these dailies averaged 23 pages each, and during 1922 they rose to 25 pages. For the same years the Sunday issues of these papers averaged 79, 80 and 81 pages respectively.

There are more than 22,000 newspapers in the United States and Canada, of which some 18,000 are monthlies and country weeklies, while the circulation of the English language dailies is approximately 30,000,000 for the week-day issues and 20,000,000 for the Sunday issues.

Total Advertising Volume Increases

The total volume of newspaper advertising in the leading cities

NEWS PRINT MILLS IN NORTH AMERICA

UNITED STATES

Company	Head Office	Capacity
Alexandria Paper Co.	Alexandria, Ind.	50
Algonquin Paper Co.	Ogdensburg, N. Y.	80
Cliff Paper Co.	Niagara Falls, N. Y.	38
Consolidated Water Power & Paper Co.	Wisconsin Rapids, Wis.	213
Crown-Willamette Paper Co.	San Francisco, Cal.	410
De Grasse Paper Co.	Pyrites, N. Y.	173
Escanaba Paper Co.	Escanaba, Mich.	107
Finch, Pruyn & Co.	Glens Falls, N. Y.	129
Flambeau Paper Co.	Park Falls, Wis.	25
Gilman Paper Co.	New York, N. Y.	42
Gould Paper Co.	Lyons Falls, N. Y.	94
Grandfather Falls Co.	Merrill, Wis.	32
Great Northern Paper Co.	Millinocket, Me.	740
Great Western Paper Co.	Ladysmith, Wis.	57
Hanna Paper Corporation	New York, N. Y.	182
Hawley Pulp & Paper Co.	Oregon City, Ore.	26
Hennepin Paper Co.	Minneapolis, Minn.	33
High Falls Pulp & Paper Co.	Chateaugay, N. Y.	24
Inland Empire Paper Co.	Millwood, Wash.	90
International Paper Co.	New York, N. Y.	1006
Itasca Paper Co.	Grand Rapids, Minn.	50
Kennebec Paper Co.	New York, N. Y.	49
Manistique Pulp & PaperCo.	Minneapolis, Minn.	60
Minnesota & Ontario Paper Co.	International Falls, Minn.	241
Nekoosa-Edwards Paper Co.	Port Edwards, Wis.	47
Northwest Paper Co.	Cloquet, Minn.	75
Oswegatchie Paper Co.	Natural Dam, N. Y.	50
Oswego Falls Corporation	Fulton, N. Y.	34
Pejepscot Paper Co.	New York, N. Y.	123
Pettebone-Cataract Paper Co.	Niagara Falls, N. Y.	27
St. Croix Paper Co.	Boston, Mass.	150
St. George Paper Co.	Norwalk, Conn.	31
St. Regis Paper Co.	New York, N. Y.	165
Sherman Paper Co.	Watertown, N. Y.	52
Tidewater Paper Mills Co.	Brooklyn, N. Y.	100
Watab Paper Co.	Sartell, Minn.	34
Washington Pulp & Paper Corp.	San Francisco, Cal.	116
Waterway Paper Products Co.	Chicago, Ill.	35
West End Paper Co.	Carthage, N. Y.	36
Wisconsin River Paper & Pulp Co.	Neenah, Wis.	65
	Total	5,091

CANADA

Company	Head Office	Capacity
Abitibi Power & Paper Co.	Montreal, Canada	464
Bathurst Company	Bathurst, N. B., Can.	50
Belgo Paper Company	Shawinigan Falls, Quebec	303
J. R. Booth	Ottawa, Ontario	147
Brompton Pulp & Paper Co.	East Angus, Quebec	106
Canada Paper Co.	Windsor Mills, Quebec	41
Donnacona Paper Co.	Donnacona, Quebec	109
E. B. Eddy Co.	Hull, Quebec	56
Fort Francis Pulp & Paper Co.	International Falls, Minn.	144
Fort William Paper Co.	Fort William, Ont.	160
Laurentide Co.	Grand Mere, Quebec	374
News Pulp & Paper Co.	Montreal, Canada	34
Ontario Paper Co.	Thorold, Ontario	281
Pacific Mills	Vancouver, B. C.	228
Powell River Co.	Vancouver, B. C.	227
Price Brothers & Co.	Quebec, Canada	315
Spanish River Pulp & Paper Mills	Sault Ste. Marie, Ont.	652
St. Lawrence Paper Mills	Three Rivers, Que.	120
St. Maurice Lumber Co.	Three Rivers, Que.	252
St. Maurice Paper Co.	Montreal, Can.	116
	Total	4,179
	Grand Total, U.S. & Can.	9,270

NEWFOUNDLAND

Anglo-Newfoundland Development Co.	Farrington St., London, E. C.	202

MEXICO

Fabricas De Papel De San Rafael Y Anexas, S. A. Mexico	50

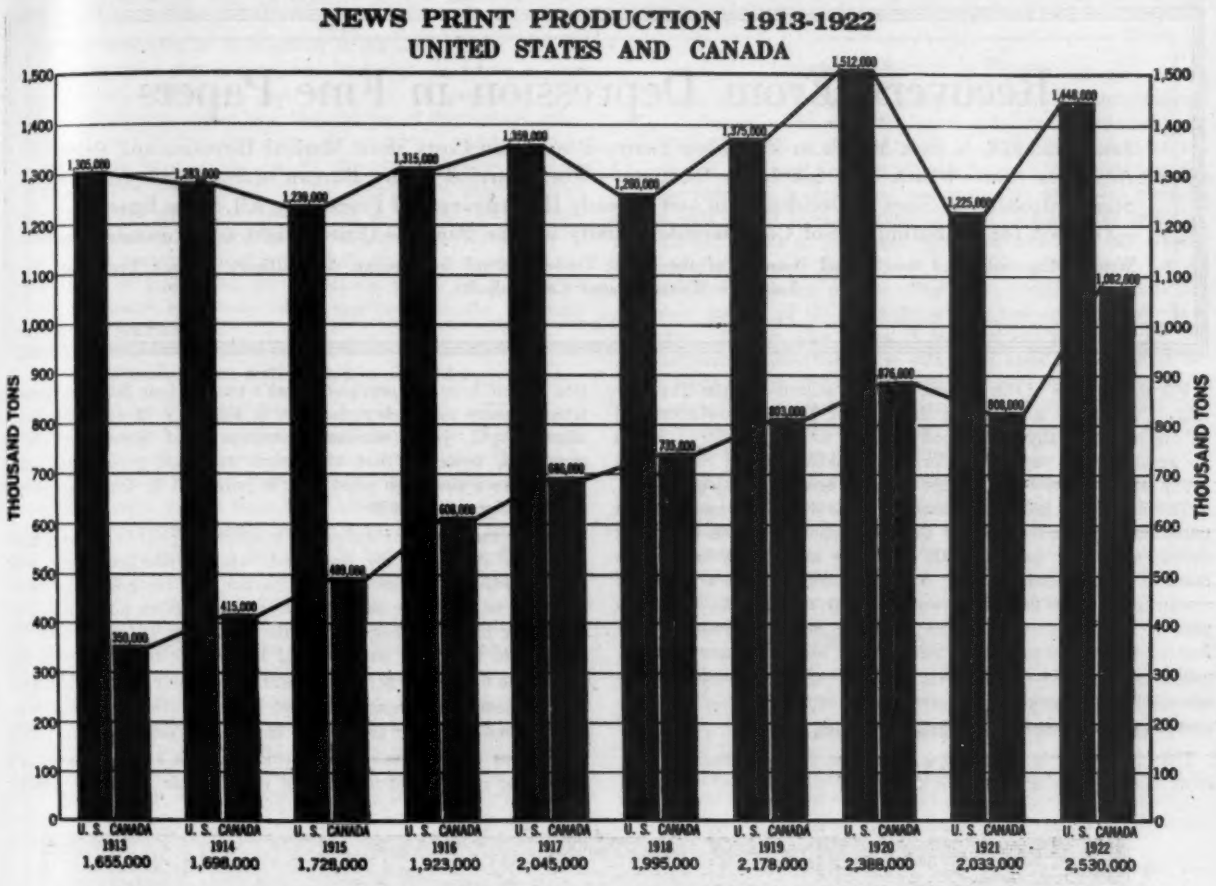
Includes news print mills to come into operation by July 1, 1923, but does not include mills which run chiefly on other grades and only to a small extent on news print.

Compiled by

THE NEWS PRINT SERVICE BUREAU

342 Madison Avenue, New York

February, 1923



in the United States showed a substantial increase in 1922 over 1921 but about 5 per cent decrease from the 1920 record figures. The newspapers fared much better than the magazines in the advertising field, since the volume of advertising in the national periodicals was only 4 per cent more in 1922 than in 1921 and was still 34 per cent behind the 1920 total.

Great Year for Advertising

The total value of newspaper and periodical advertising in the United States in 1922 was probably $800,000,000 with $700,000,000 of it in the newspapers. The large volume of advertising both periodical and newspaper, planned for and to be expected during 1923 is a matter of common knowledge. It looks as if the time were not far distant when the total yearly expenditure for advertising by means of the printed page in North America would be one billion dollars.

Paper manufacturing in North America is also a billion-dollar industry with the production of news print making up a very respectable proportion of the total investment and further notable developments under way. The new machines to come into news print production during the first six or eight months of 1923 will have a capacity of 700 tons of paper daily, carrying the total capacity of the industry beyond 9,000 tons daily, of which some 5,000 tons is in the United States and more than 4,000 tons in Canada. Still further extensions are under consideration, so that the newspaper publisher wherever he may be in North America during 1923 should be able to get all the paper he needs without going overseas for any portion of his supply.

NETHERLANDS' PAPER EXPORTS GROWING

Consul General G. E. Anderson at Rotterdam has sent the following report to the Department of Commerce regarding Netherlands' paper exports for January:

"There was great activity in the Netherlands paper trade during the month of January. Exports of news print amounted to 2,535 metric tons, of which 964 tons went to Great Britain, 878 to the United States, and 381 tons to France. Exports of heavier printing paper amounted to 1,339 tons, South American countries being the best buyers. Exports of strawboard, the bulk of which goes to Great Britain, amounted to 15,473 tons, and exports of packing paper amounted to 586 tons."

GOOD YEAR FOR PAPER IN BELGIUM

The general situation of the paper mills in Belgium has been very good throughout the year, and there was a large increase in the use and a like increase in the demand for news print paper, according to a report received by the Department of Commerce from the American Consul at Antwerp on the Belgian paper industry. Exportation was larger than during 1921, though the heavy home demand left little for export.

Average prices for all qualities of paper went up 40 per cent during the year, caused by the 20 per cent increase in cost of raw materials in the countries of origin, and the decrease in the value of the Belgian franc.

Recovery From Depression in Fine Papers

January, 1923, Is Best Month in Past Five Years—Production Costs Show Marked Increases and Price Advances Start Which Are Likely to Continue—Work Carried on by Bureau of Standards for the Standardization of Sizes Is Decided Gain and Already Has Approval of Practically All Those Interested —Outlook for a Continuance of Considerable Activity in Fine Paper Is Quite Bright and Encouraging.

Written Especially for the Annual Number of the Paper Trade Journal by George A. Galliver, Former President American Writing Paper Co., Holyoke, Mass.

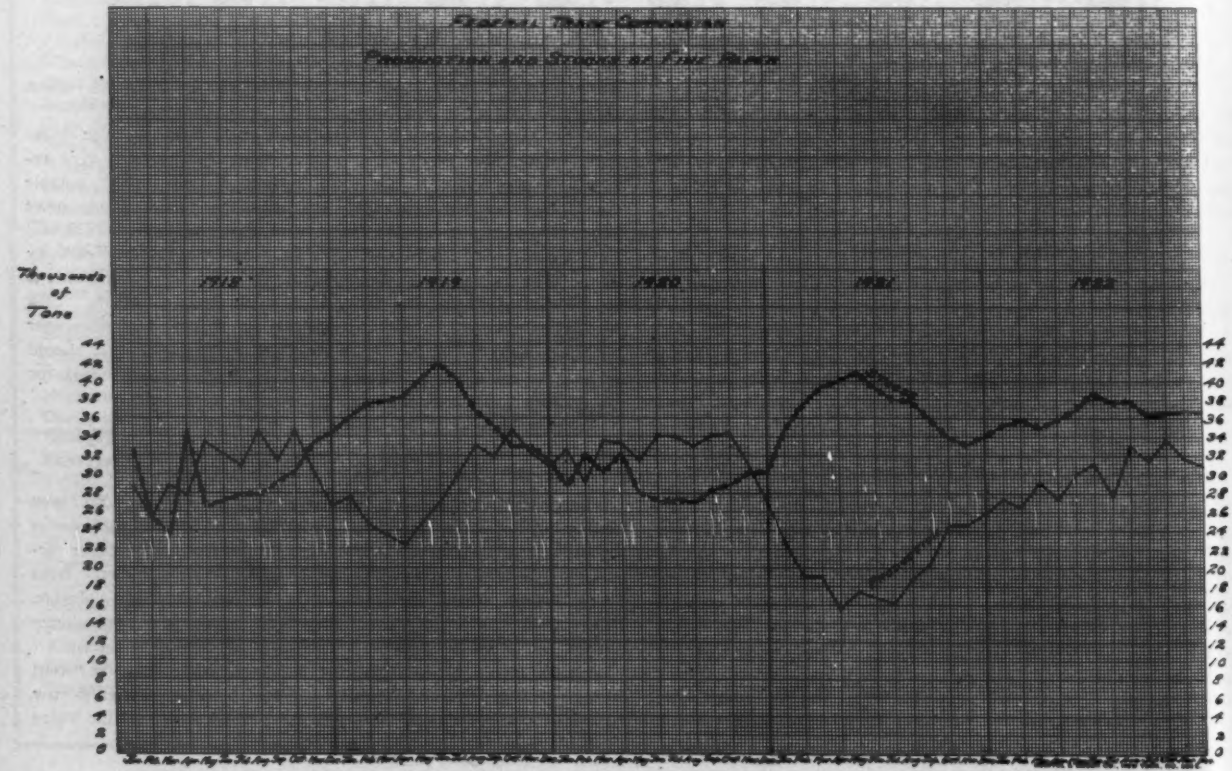
For the purpose of this review, we shall assume that the classification of fine paper as given by the Federal Trade Commission will be the one generally understood to apply to that industry. When we speak of fine paper, therefore, it is taken to mean the general group of writings, bonds, linens, ledgers, bristols and papeteries.

The fine paper industry entered the year 1922 in a more or less unsettled condition. It is true that production had been increasing during the latter part of 1921 over the abnormally low points reached in the middle of 1921, but that there was still a period of readjustment to be undergone was generally recognized. The early part of 1922 witnessed declines in paper prices. Hesitation and fear of the immediate future were shown alike by manufacturers, paper merchants, and printers. Buying was on a hand-to-mouth basis and the general feeling was one of uncertainty.

Trend Clearly Upwards

That the trend in output was clearly upward is shown by the chart marked "Production and Stocks of Fine Paper." Production fell off from the previous month's total at four different periods from January to October; namely, in February (a seasonal movement), April, July (seasonal movement) and September. It is significant, however, that after each recession production broke through to a new high point for the year, and by October reached the high figures of 1920.

During the period of increasing production, prices remained comparatively stable on the one hand, while production costs were showing marked increases. This situation was recognized by manufacturers in the latter part of the year with price advance started and likely to go further. From the standpoint of production, the industry in the latter part of 1922 had recovered the ground lost during the depression period and was back nearly to the 1920 level. That tendency was brought forward into 1923 after the usual year-end seasonal decline at the time of inventory taking. January, 1923, output was the best month experienced in the last five years and though the complete figures are not yet available, the entire quarter



will probably show as well, particularly against any other first quarter.

From the standpoint of development in the industry, the achievement and the trend that is most significant for the future is that in the line of simplification and distribution of products. The Bureau of Standards, acting as a co-ordinator of the various interested branches of the industry, has made actual and sound progress. The work they have carried on for the standardization of sizes is a decided gain and already has the approval of practically all interested. Their plans for establishing a simple, uniform, and authentic vocabulary are progressing satisfactorily. Their achievements to date make us hopeful for their further successes in the establishment of grades and the elimination of the many kinds of needless confusion and waste which now exist in the language, practices and products.

Manufacturers Setting Houses in Order

But the movement in this direction has not been limited to the concerted action and co-operation through the Bureau of Standards. The individual manufacturers have been setting their houses in order. They have learned that while a very complex line with overlapping brands may at times bring about a greater total volume of sales, it introduces so many slow moving items and causes such manufacturing inefficiencies and costs in bad turnovers that it decreases the total profits. The paper merchant is also beginning to realize that the same thing applies to him. He might sell more goods if he were agent for and stocked everything made in America, but he certainly could not make money. The printer also is similarly situated.

The tendency, therefore, throughout the industry is toward a smaller number of brands of more or less fixed quality and characteristics. Naturally, following this is the tendency toward closer relationships between the merchant and the manufacturer, the merchant trimming his lines to those on which he can get volume and insured turnover and on which he can obtain the service and value which the mill can guarantee only through standardized goods on a practicable mass production basis.

Not only is this tendency, which we believe is developing naturally and gradually without revolutionary results, leading toward a stability of quality, but also toward a complete stabilization in the commercial practice of distributing and utilizing fine paper. The old practice of creating new brands to meet every emergency that arose, be it a price advance or what not, was purely a policy of opportunism and in the end was bound to prove very costly. For every new brand introduced, someone in the industry had to pay for the initial sales promotion effort—special introductory prices and terms, unusual sales drives for introduction of the line, etc.—and for every gaining of a foothold by a new line some old line fell into disuse and either was carried as slow-moving items or was dumped on the market at bargain prices to clean out the stock. Someone paid. In the final analysis, the industry as a whole had to suffer for these abuses. Either the cost had to be passed on in some form or the losses absorbed. As a matter of fact, both were done until the consumer realized poorer values than he should have, while the manufacturer and distributor received smaller returns than were their due. With the gradual advent of simplified lines and standardized goods, merchandised through simplified and standardized methods, there is developing a stability in our industry which makes for the good of all.

We may well be proud that our industry, although previously one of the worst offenders against the principles of simplification and standardization, is being classed among the leaders in realization and achievement. The entire trend of the times in every line is toward such standardization, and that industry which fails to keep pace will lose the confidence of the buying public. It behooves us then to see to it that our march toward complete simplification and standardization should be kept as rapid as is consistent with soundness and safety.

Immense Reduction in Brands

An important effect which the general movement toward standardization is bound to have on the paper industry is indicated in a recent interview given out by Julius H. Barnes, president of the Chamber of Commerce of the United States. He points out the immense reduction in items and in brands that has taken place in a very wide list of products, ranging from paving bricks to bread, from pocket knives to fertilizers, and from collars to car wheels. In each of these cases the reduced line makes it necessary for the manufacturer to carry on an advertising campaign to show the consumer that all of his needs can still be met and that more economically. And it also makes it possible and profitable for the manufacturer to advertise. His volume of sales on each item becomes large enough and the possibility of increase great enough to make advertising profitable. Therefore, Mr. Barnes contends that standardization is a potent creator of new advertising, and advertising is what makes the paper mills run.

The need for a widespread and complete standardization of paper in America is accentuated by the fact that many foreign countries, notably Germany and Holland, are considerably in advance of us at this moment. If we are to maintain our foreign markets which are so necessary for the absorption of our surplus production, we shall have to keep pace with these competing countries.

Hopeful Predictions

Our business outlook for 1923 and 1924 is quite bright. Many excellent authorities are giving most hopeful predictions. For example, the following is quoted from the *Standard Daily Trade Service* of Friday, March 9:

"Analysis of conditions in the paper manufacturing industry reveals the following facts and leads to the following conclusions:

"That current production and demand are above normal, and are close to the peak reached in early 1920;

"That output of all grades of paper in 1922 was 31 per cent greater than in 1921, but was 4.3 per cent less than in 1920.

"That the recovery in paper production since the low point in the summer of 1921 has been followed by only a partial recovery in prices. On February 1, the combined average of fine, wrapping, book, and paper board prices was precisely equivalent to average prices for this group of papers during 1919. While this average was 42 per cent below the high reached in September, 1920, it was only 23 per cent above the extreme low touched in May, 1922;

"That recovery in paper prices was retarded fully one year after the turn in paper production, and the turn in the general commodity price level;

"That while mark-ups have been exceedingly conservative, the general tone of the market has been buoyant for the last eight months;

"That higher paper prices are in prospect as long as the upward business trend shall continue, but only slight upward revisions will be put into effect at any one time."

Given a continuation of the present business activity or probably an acceleration of it, we have before us two years of good business. These years must be utilized both for putting our business on a profitable basis and for the development of a permanent strength in our industry.

Aim for the Year

The following excerpts taken from editorials which recently appeared may well be taken as our aim for the year before us:

"We believe that a profitable year is one in which the industry as a whole can produce its goods and market them at a gain over the cost thereof. And with that definition in mind we unhesitatingly

reply that from the present outlook, 1923 is to be a profitable year, *providing*, first and last, that the producing units of manufacture in the industry will each remember the tragic lesson of the last three years, which is that if they continue to sell goods at or below cost they will surely land in the financial cemetery.

"Let us make this a little more specific.

"Profit is to business as blood is to the human body. If, therefore, you let the blood out of a body as fast as it is produced the body will die. And any manufacturer who produces paper or any other commodity and continues to sell it below cost will not only fall into the hands of the financial undertaker, but he also helps assassinate the profits of all other factories in his line. It is the spectacle of the man who finds himself drowning, grabs good swimmers about the neck and pulls them down to destruction in the whirlpool with himself, simply because he would not learn to swim when he could and should.

"We have had a two years' struggle with ignorant, willful business assassins and pirate price cutters, men who either don't know their costs or if they do, don't know the first principle of business, which is to make a profit.

"This is the beginning of a profitable year; it is the alpha of the industry, so to speak. The ending, the omega of the 1923 activities, all depends upon this prime factor of profit. Never since the war began has there been a better business outlook. But unlike the war years, there are no artificial stimuli for profit.

"Profits depend upon the proprietor knowing what he is doing and doing it at a profit.

"Business can be done, is being done, and must be done at a profit."

"Once upon a time somebody well said that the only difference between a rut and a grave was its length and depth.

"The paper manufacturing business has been in a long rut; it must get out of it. The industry must not remain in the rut of wrong past methods that lead to the industrial graveyard, but advance along a new trail and toward that shining goal of commercial success and supremacy that beckons it forward.

"For generations paper mills of this country have been making paper at a price. Paper production and sales price have been too long the only ambition of paper producers. Year after year has passed only to witness the continuance of the futile system of producing paper at a price which should undersell all competition. Volume of tonnage has been the slogan of the production departments; price has been the yelp of the sales departments.

"The general paper buying and consuming public know nothing about grades or qualities. Paper is paper to them, and the order-taker with the lowest price has generally obtained the order, and while one mill got the business one day by making a low price, another mill got the order next time by making a still lower price. No profit to the manufacturer, and rightly so, because he stayed in the rut, too lazy or ignorant to make the effort to get out of it.

"But now the time has come when they must all get out of the rut or end in the grave.

"From out the conferences and deliberations of the last two paper conventions of this year has come from both paper manufacturers and merchants the insistent demand for standardization—standardization of product and also of sales methods. One must inevitably follow the other, for the full fruit of the standardization of product cannot be garnered except by scientific merchandising.

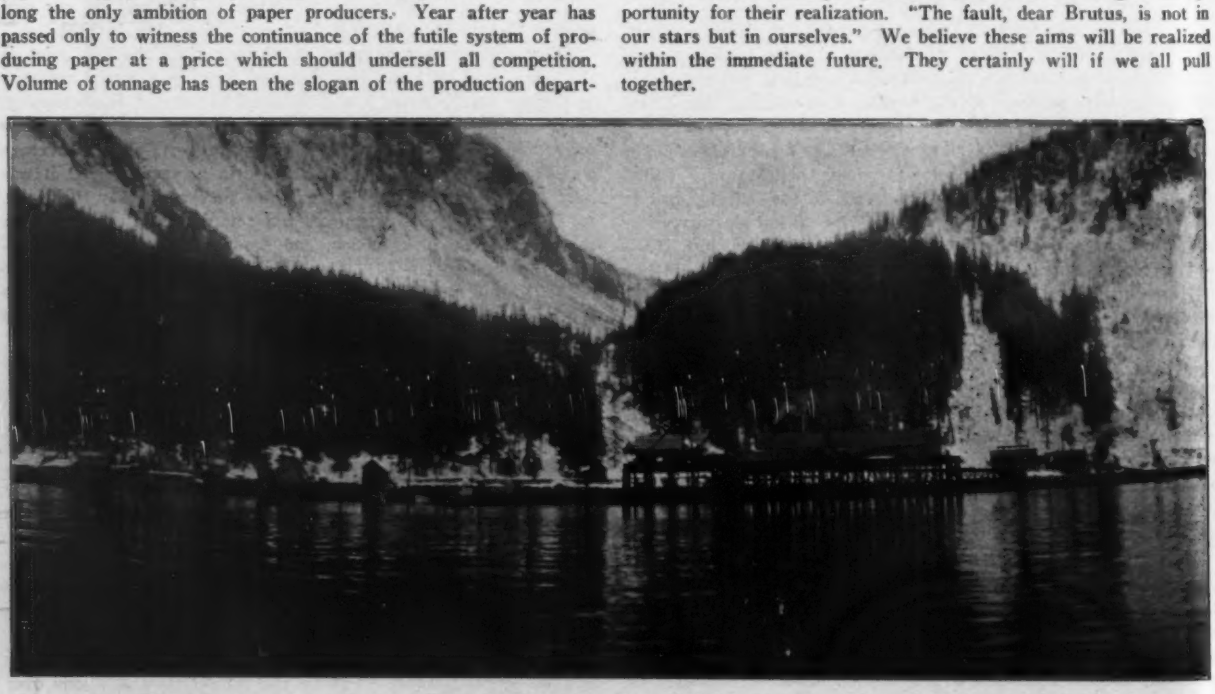
"Standardization of product; what does that mean? Just this: That each mill will develop that particular grade of paper that it is best equipped to most efficiently produce at the lowest cost unit, at capacity operation. It will put this grade on the market under its own trade mark brand at a price that nets a fair profit over all expense. It will maintain the grade and quality of that brand irrespective of market changes and will be so proud of it that the merits and qualities of it will be told to all consumers, and a demand thereby created and sustained for it.

"'But,' one of our dear old friends pokes his head up over the rut to say, 'it can't be done.'

"Well, it has been done; done by the coal industry, by the flour industry, by the bread industry, by the clothing industry, by the knitting industry, by the textile industry, and it is being done by members of the paper industry. And it pays, and will continue until the whole paper trade has become standardized.

"You will either get out of the rut, or be buried in the grave—which?"

The great encouragement to us who are interested in fine papers comes from the fact that the ends indicated in the above quotations can be realized. The prosperous months ahead of us give us opportunity for their realization. "The fault, dear Brutus, is not in our stars but in ourselves." We believe these aims will be realized within the immediate future. They certainly will if we all pull together.



MECHANICAL PULP PLANT OF THE ALASKA PULP & PAPER CO., SPEEL RIVER, ALASKA. FIRST AND ONLY PULP MILL IN THE TERRITORY AND NOW IN CONSTANT OPERATION

Wrapping Paper Market In Steady Condition

Although Considerable Losses Were Sustained Early in 1922, Business Based Upon an Actual Healthful Demand and Not Upon Any Scare or Fright Has Gradually Expanded Since Then—Merchants Should Not Attempt to Force Sales Beyond the Absorbing Capacity of the Trade Otherwise Depression Is Again Bound to Follow—Dealers and Manufacturers Should Co-operate—Value of Associations.

Written Especially for the Annual Number of the Paper Trade Journal by F. E. Floyd, Sec. of the Crescent Paper Co., Indianapolis, Ind.

To look back over and comment about the year, since the last National Paper Trade Association meeting, would be nothing but "history writing," and should be left for those thus inclined. To look into the future and predict the possible happenings of our industry, would tire the reader and mean nothing when read.

Faith in the Future

There is, however, a thought or two which is interesting to most of our industry and which rings clear the note of optimism and faith in the future. The experiences of the past, to be sure, are the basis for all thought of the future, so it is necessary, therefore, to treat both the past and future as being relatively close and concurrent in action.

A well grounded, substantial paper merchant is usually one who does not entirely depend upon his own personal prowess to buy and sell his merchandise, but, on the contrary, seeks the wisdom and counsel of others—the manufacturer, the competitor, the association member far distant removed, as well as those in his own organization. A member of the paper fraternity thus inclined is constantly in touch with information which broadens his thoughts, polishes his vision and sharpens his acumen. This is all worth while. Better still, he is in a position to give to his fellow associate some thought, however slight it may seem to him, that will help the other fellow's work, his method, his business and his profit, to the credit of the first merchant and great benefit to the second.

A Competitive Business

The wrapping paper business has been, and in some respects still continues to be, a very highly competitive part of our large and necessary industry. True—competition is the life of trade and I admit it is essential, but I do not admit that it is license for fight, hatred or unfair practices. My theory is this—legitimate competition is worthy of its calling—it keeps us all on our toes—it makes us fair—it makes us active. No one who desires to be any of these three need fear the result if he *is* any of these three.

What has all this to do with the future of the wrapping paper business? The future of our merchandising success does not rest in the volume or the quantity of wrapping paper we sell, but in the result obtained in our transactions, however large or small, with our customers—such result measured only by the "yard stick" of good goods, well placed, with the proper amount of honest service. A customer today and the same customer tomorrow is the goal to which we all aspire.

Should Be Traders, Not Sellers

The wrapping paper industry begins with the manufacture of paper suitable for a given purpose, followed by a distributing agency properly educated to locate the given purpose and distribute in quantities desired in an efficient manner. All this can be done if the same earnest thought and endeavor is given to the distribution as is given to the manufacturing. In my opinion, we have nothing to fear from the manufacturing end of our industry, because if we demand good paper, well made and properly named, we will get it. Therefore, we, as merchants, must be the judge of the proper quality for a certain demand. As soon as we all—not a few, but all—bring our thoughts to the proper and careful selection of our merchandise and sell it at a fair return, just that soon will the public realize that our branch of the industry is qualified to operate on a safe, sound and equitable basis instead of a basis of "Dog eat Dog," filled with fright every time a prospective buyer uses either falsehoods or insinuations, which tend to scare our salesmen and even ourselves to a point of trading instead of selling.

Experiences of the Past Year

Calling upon the last year for experiences, we have for our answer many perplexing reminiscences. We remember the losses sustained through the several first months of 1922—the lack of enthusiasm for placing business, etc. We then see on the horizon a light, not dazzling in brilliancy, but steady, with its glow continually increasing, and we begin to hope. Our hopes turned to fruition. It became apparent that the increase in the wrapping paper business was based upon an actual healthful demand and not upon any scare or fright. Investigation showed that this increasing business was the result of careful analysis by the buyer, to the effect that speculation was not the word, consequently the steady growth, the result of which we are now all enjoying.

This condition makes for our present healthy state of business. It also keeps before our minds the very important thought, viz: a good demand without a speculative purchase makes a firm and not a flighty market. Whenever we have a steady influx of reasonable orders we do not "rock the boat," but if orders are placed in a frenzy for foothold, then cancelled after serious thought, we certainly reach a condition unhealthy for ourselves as merchants and very undesirable to our friends, the mills.

Now at the Top of the Hill

We are now on top of the hill, firm in our belief that the market is steady, and if we can so conduct ourselves and watch our efforts to merchandise on a safe and sane basis, we will find a large plateau there on the top, on which we may build a strong and healthy business for years to follow. On the other hand, if we attempt to force our sales, to fill up our trade and sell them the theory that we are going up—up—up, we will stretch and break our guy ropes and go down—down—down. This we have done on one or two occasions and we do not want a repetition of the bitter dose.

Value of Co-operation

If we believe all we have said in the foregoing paragraphs and think that the real basis for good substantial business is outlined therein, what then should we do to maintain the fair and equitable standard in the wrapping paper business? We should become better acquainted with each other in the business—we should strive

in our own localities to so conduct our respective organizations that we may place ourselves in high esteem—we should be frank and open with our mill connections—we should take their representations as they give them to us and not force them down on quality or price. If their lines do not interest us, remember that some other merchant, surrounded by different conditions, may be interested. To sum it all up, we should all know that friendship, tried and true, will make for us all a condition of merchandising of which we may all be proud and one upon which at the end of each succeeding year we can look with self-contentment and pride, knowing we have learned the true use of the Golden Rule in business as well as in social intercourse. Then finally, as has been so well said, "The business man who does not belong to an association that may properly claim his support, is not doing his full duty to himself or to his community. To make his efforts effective, he must co-operate with his business associates and competitors."

POLISH PAPER INDUSTRY AT STANDSTILL

A report received from H. B. Smith, acting commercial attache at Warsaw, states that the Polish paper trade is reported to be at a standstill, due mainly to substantial sales prior to the recent price advance. Wholesalers are reported to be offering goods cheaper than the prices quoted by the manufacturers.

MONROE PAPER CO. TO RESUME MAY 15

The Monroe Paper Company, Monroe, Mich., which was burned out late last fall, has started its rebuilding program and according to E. A. Mitchell, assistant manager and secretary, will be ready for production by May 15.

This concern is erecting structures to house the machine room, beater room, jordan room and engine room. Concrete blocks are used in building, while all roofs are to be covered with red granite roofing paper.

The new equipment to be installed will include a Brownell engine of the latest type, a Wickes boiler, 150 horsepower and 125 pounds pressure. It is a horizontal, tubular boiler, all settings and linings being in the best grade of fire brick. Two 1,000 pound Emerson beaters will be placed in the beater room.

The mill is equipped with a 48-inch cylinder machine, the widest trimmed sheet produced being 44½ inches. All grades of coarse and fine wrapping papers are made. The mill specializes in gray express and black hardware.

In addition to buildings for the mill proper, a machine shop, 40 by 50 feet, is being built. Assistant Manager Mitchell reports that when all improvements under way are completed the mill will be in fine condition.

The plant was established in 1866 and is the pioneer of the industry in Monroe and one of the oldest in Michigan.

AIRPLANE VIEW OF THE BELGO PAPER CO., SHAWINIGAN FALLS, QUE.

1923 Brings Steady Advances in Foreign Pulp

Sweden, World's Second Largest Producer of Chemical Pulp, Started 1922 with Stock on Hand of 180,000 Tons—By Close of Year This Had Been Absorbed by U. S. and Prices Showed Firming Tendency—Swedish Pulp Lockout Looms as Menace—Nearly Quarter Million Tons Withdrawn from Production—Finland Makes Distinct Gains—Exports From Finland to U. S. in 1922 About 60,000 Tons.

Written Especially for the Annual Number by Hans Lagerloef, President Lagerloef Trading Co., Inc.

The United States is known as the country of big dimensions. It heads the list in almost everything, including the manufacture of chemical pulp, which averaged about 1,800,000 tons during the last five years. Next on the list as a producer of chemical pulp comes Sweden, manufacturing about half as much as the United States. While we have peace in our wood and paper industries here in the United States, Sweden has not been so fortunate. Since the end of 1922 and intensified since the beginning of 1923, the situation in Sweden in that line has been one of strife and upheaval.

The Outlook in Sweden

The men in the woods were out for quite some time, but now the difficulties between the operators and the men have been settled. The effects of curtailed operations in the woods in Sweden will, of course, only be felt in a year or two. More serious has been the general walk-out and lock-out in Sweden, not only in the paper mills, but also in the chemical and ground wood pulp mills. During the last few weeks, the paper mills have succeeded in making a settlement with their workmen covering a wage scale to run until about February 1st of next year. The negotiations to settle the differences in the chemical and ground wood pulp industries in Sweden have so far failed and the general lock-out is still on. At this writing there are no hopeful signs of a speedy settlement of this unfortunate situation. It is estimated that about 2,500 tons of sulphite and 800 tons of kraft are taken out of the market every working day by this stagnation. Estimating conservatively, since the strike and the lock-out, the manufacture of chemical pulp in Sweden has been curtailed up to this time by not less than 240,000 tons of pulp. The strike in Sweden has therefore taken out of the market more than half of the tonnage that we received last year from Sweden, being the largest quantity ever imported from that country in one year. The figure is tremendous, when one stops to consider that it is about twice as large as the combined imports to the United States from all sources except Sweden and Canada.

The world can ill-afford a state of affairs of this kind. We need production and turn over to heal the wounds of the war. Ever since the beginning of the World War and after the Armistice market conditions and prices have been so erratic that it is absolutely futile and impossible to anticipate and plan more than a few months ahead. There are no old standbys by which we can map out our work and look ahead and see how things are most likely to shape themselves. The way pulps generally, and more specifically, chemical pulps have been moving during the last years is a good example. In 1922 Sweden, as the second largest producer of chemical pulp, commenced with a stock on hand of about 180,000 tons. This accumulation from the previous year proved to be an actual burden then forcing prices down and we saw the low in the market in May, 1921. The United States came to the rescue. Business began to speed up among our paper mills here and we had to draw supplies of chemical pulps more heavily from outside sources. Our needs were so great that not only was this market able to absorb a great portion of the production as it gradually went on in Sweden in 1922, but in addition, we were able to buy vast quantities of the stock left over in Sweden from the year 1921.

Stocks Greatly Diminished by End of 1922

At the close of 1922, the Swedish chemical pulp situation, therefore, was a very healthy one. There were no heavy stocks on hand unsold to contend with in 1923. It would therefore seem as if the disquieting effect produced by the stagnation in the chemical pulp mills in Sweden, especially upon the paper business here in the United States, would speed up the buyers in entering the market broadly and, as a consequence, send prices soaring. However, it took quite some time before the market responded definitely to the effect of the Swedish strike situation, it was only around the middle of March.

The only plausible reason why the market should have remained as quiet as it did for such a long time is that United States broke all records as a customer of Sweden during the year of 1922. The exports from Sweden to United States in 1922 amounted to over 400,000 tons and practically half of this was for shipment at the close of navigation (during November, December and January). Statistics show that this country received from Sweden alone in January about 45,000 tons and this may explain why the market did not advance before.

Parallel with 1920 Pulp Conditions

While there has been an enhancement in value of a ½ or possibly one-half of a cent, we have not as yet seen anything like the panic in prices that we experienced in 1920 and we must hope that it will not be repeated. However, there is a parallel between this year and 1920 as far as prices go here and in Europe. At the present time, Great Britain, France, etc., are outbidding American buyers and are paying better figures than are now the ruling here. We had the same situation in 1920 until around April, when stocks in American mills had dwindled and the buyers came into the market en masse. Then not only did we catch up to prices paid in England and on the Continent, but later it was impossible really for any other market to follow our stride. The best for all of us, pulp manufacturers, paper makers and middlemen, would be to have prices remain fairly stationary. During the last year, we had enough of fluctuations, as for instance, whereas kraft touched low at $2.25 in May, the last quarter of the year saw quotations around $3.00. Strong sulphite on the same basis ranged from $2.40 to $3.00, and other grades in proportion.

Foreign Mills Making Fair Return Only

It is a fact that even at today's prices the mills abroad are not making any too much money. They are getting a fair

return on their investment, but that is about all. It costs about $60.00 today to make a first grade sulphite and about $58.00 for a kraft and the best proof that the market has not yet attained those heights which are really profitable is proven by the fact that there are still American sulphite and kraft manufacturers who do not find it profitable to start up their mills again after the shut-down, having found the latter more profitable in the face of Canadian and European competition.

It is interesting to note that Canada so far holds the third place as a producer of chemical pulp and comes after Sweden, manufacturing about 80% of the total production turned out by Sweden.

Decided Advances in Finnish Industry

A country that is coming very much to the fore as a source of supply for the American paper mills is Finland. Only during the last few days we have read how this little country, after having thrown off the Russian yoke and attained the position of a sovereign nation has been the second European country to offer to reimburse the United States for those kindly advances in money and foodstuffs given her in her hour of need in 1918 and later. It is a great credit for Finland to follow so closely in the wake of Great Britain, who took the initiative.

Before the war, Finland was represented directly in the United States only by one or two brands of pulp and in comparatively small quantities. Most of her sulphite and sulphate were sold via Germany or other countries, thereby losing their identity and original brands before reaching the consumers here. Since becoming independent, Finland has arranged matters differently. She has mapped out a policy to attain the proper place as a factor in our market and figures as gathered by the American Paper & Pulp Association prove that she is making good strides in that direction. Imports from Finland to our country during the years as mentioned were as follows:

1919	15,326 tons
1920	29,686 "
1921	43,776 "

For 1922 the figures have not as yet been published by the Association, but I can state that they will be about 60,000 tons. It is remarkable and gratifying that Finland should show such an even record of progress in our market since the Peace as no other country has in chemical pulps.

New York, N. Y., April 4, 1923.

BOOK MILLS REACH PEAK OUTPUT IN OCTOBER, 1922

Written Especially for the Annual Number of The Paper Trade Journal.

The book paper industry, along with all other lines, suffered from the great depression that was first felt in December, 1920, and continued throughout the year 1921. At the beginning of 1921 the mills were operating at less than 50 per cent of capacity and continued for some months on that basis, but by July a slight improvement was manifest and this has continued up until the present time.

80 Per Cent Production in January

By January, 1922, the book mills were operating at about 80 per cent and month by month a steady improvement was shown until by the latter part of the year all mills were operating at what might be considered normal full-time. The market price had dropped from the high period of September to December, 1920, to the lowest point in July, 1922. From January to October, 1922, prices remained firm with very little fluctuation in any of the grades belonging to the book paper family.

Prices Reflect Increased Costs

By October, 1922, costs had increased to a considerable extent, brought about by the scarcity and high price of coal on account of the coal strike. In October the manufacturers found it necessary to make slight advances in their prices, amounting to 4 per cent on the standard grades of sized and supercalendered and machine-finished book, and slightly more on higher grades.

Full Operating Basis Reached

From October on the prices remained firm. Increasing demands, placing the mills on a full operating basis, necessitated advances in labor and higher prices generally for raw materials. These increased costs were reflected in a further advance in prices of about 4% early in 1923.

Why Book Paper Industry Is Stable

The book paper industry seems to be fortunate in being more stable than some of the other lines in the paper trade. This is brought about, no doubt, by the policy of several of the large manufacturers which seems to be one of "the middle of the road." These concerns will not be rushed into high prices because of an extraordinary demand and will not make advances in price except upon a legitimate increase in their cost of manufacturing.

Preventing Market Demoralization

This same policy seems to apply on a weak or declining market, which prevents demoralized conditions, brought about by mills making prices below their costs, which eventually reflects a hardship on consumer and manufacturer alike.

Expect Further Advances This Year

The outlook for 1923 seems most favorable for a good, steady demand that should mean full operation for all the book paper mills. Prices will, no doubt, remain firm and perhaps advance slightly to cover increasing costs, caused by a general tendency upward of labor. This means higher prices for raw materials of all kinds.

Let us hope, however, that the book paper manufacturers will continue the wise and conservative policy that has been in existence for so long and not advance prices because of an excessive demand.

DEMAND FOR PAPER IN THE PHILIPPINES

Paper stocks in the Philippine Islands are reported to be ample, with a lowered demand for most grades, with the exception of old newspapers, stocks of which are very low and which it is being found very difficult to replace from the Pacific Coast, says Trade Commissioner Fowler to the Department of Commerce in a dispatch from Manila. He continues:

"There is also a good demand for cheap sulphite bonds, in spite of the fact that large stocks are on hand. The demand for forty pound book stock, however, is under normal, prices in some cases being below replacement, and it is reported that the Japanese are making deliveries of better qualities than formerly at competitive prices. Copy book stocks are heavy, with a light demand, on account of the approaching school holidays, and the unloading of speculative stocks has depressed the market for flat news. The demand for toilet papers, of which stocks are ample, is also reduced."

Paper Makers' Chemicals in Readjustment Period

Return To Normal Conditions Retarded in 1922 by Labor Difficulties, Fuel Shortage, Transportation Tie-Ups and Uncertainty as to New Tariff Bill—Fall, However, Witnessed a Marked Improvement and Business at Present Is Healthful and Is Showing Steady Expansion—Paper Manufacturers at Present Receiving Two-Thirds of Supplies of Casein from Foreign Sources—Outlook Promising.

Written Especially for the Annual Number of The Paper Trade Journal by Guy A. Gardner, Manager, Chemical Div., M. Gottesman & Co., Inc.

The industrial chemical situation for the past twelve to fifteen months was greatly influenced by conditions incident to the readjustment period of previous years. Among the factors throughout the year which hampered the return to normal business were labor difficulties, fuel shortage, transportation tie-ups and uncertainty as to the new tariff bill.

Hand-to-Mouth Buying Early in 1922

Although the greater portion of the surplus chemical stocks had been absorbed by consumers previous to the passing of the Fordney-McCumber bill, importation of large quantities of foreign chemicals strongly influenced market prices. During the early part of the year, business was of a hand-to-mouth nature, and chemical manufacturers were operating either at a loss or on a dollar-for-dollar basis, in order to keep their plants in operation and their organizations intact. Along in the summer months, consumers of chemicals found themselves short of supplies and came into the market for fairly large tonnage. This buying increase found manufacturers with a scarcity of stocks and an active resumption of business resulted. Prices on most commodities began to respond proportionately and gradually production increased to a point where, volume considered, it became profitable to continue manufacturing on a sound basis. Some chemicals have been materially reduced in price, but the volume consumed has proportionately improved, and the situation has generally been most gratifying to the manufacturers.

Tariff Passage Increases Confidence

The passage of the tariff bill in September further augmented the optimistic feeling of confidence on the part of both the consumer and manufacturer. Buyers were more inclined to anticipate their future requirements, particularly in view of stiffening price ideas. Contract business was accelerated and continued over the balance of the year at a good rate. The enactment of the tariff bill was perhaps the greatest event of the year. With the feeling of uncertainty previous to its passage removed, improved business was the result. Heavy chemical manufacturers, as a whole, are evidently satisfied with the rates on imported material, although instances of sharp tariff increases in paper makers' chemicals are reflected in increasing costs to the paper manufacturer. Some of the rate changes are listed below:

Article	Underwood Tariff 1913	Fordney-McCumber Tariff, 1922
Aluminum Sulphate	15%	¾c. per pound
Blanc Fixe	20%	1s. per pound
Bleaching powder	1/10c. lb.	3/10c. per pound
Casein	Free	2½c. per pound
China Clay	$1.25 ton	$2.50 per ton
Soda Ash	Free	¼c. per pound
Caustic Soda	¼s. per lb.	½c. per pound
Sodium Bisulphite	¼s. per lb.	¾c. per pound
Sodium Silicate	Free	¾c. per pound

Imports Greatly Decreased

These tariff changes, together with other important factors, resulted in the reduction to a minimum of the importation of many heavy chemicals which, because of low foreign exchange rates and cheap manufacturing costs, were previously imported in considerable volume. The increased rates on such items as China Clay and Casein, for the supply of which buyers are dependent in the main on foreign sources, represent increasing costs to paper manufacturers, although, on the other hand, American producers have been given a much needed stimulus which may tend to stabilize prices and market conditions.

Capacity Operation During Fall Months

Towards the fall of the year, the improvement in business was more marked and this is especially true of the paper industry, whose consumption of chemicals makes it one of the most important fields for the manufacturer of chemicals. While there were no advances in price to compensate for the losses of the previous years, the most encouraging feature was that the increasing demand necessitated practically capacity operation of most plants. Before the year came to a close producers had disposed of a greater part of their estimated production for 1923.

Healthy Condition Now Exists

The present condition of the chemical industries appears to be a healthy one and business is maintaining a steady gain. One of the factors retarding a more rapid improvement is the inadequacy of transportation facilities to properly take care of the heavy freight movement. Reduction of freight rates last July was a much longed for and needed stimulant towards betterment of business, inasmuch as freight rates enter very materially into the delivered cost of paper makers' chemicals, but it seems that the railroads are unable to handle the increased volume of freight. An unusually severe winter has slowed down railroad operations; the railroad equipment is in a very poor condition generally, as the result of the strike of the maintenance men, and it is evident that business during the past few months has expanded in a degree more rapidly than the railroads were prepared for.

Price Comparison with April, 1921

An idea as to the comparison of prices on paper makers' chemicals ranging at present, as compared with those prevailing a year ago, is indicated in the following table:

Prices F. O. B. Works—In Carload Quantities

	April 1, 1922	April 1, 1923
Aluminum sulphate, com. in bags	$1.40 100 lbs.	$1.25@$1.40 100 lbs.
Aluminum sulphate, iron free in bags	2.00 100 lbs.	2.15@ 2.25 100 lbs.
Bleaching powder, 35-37% in drums	1.75 100 lbs.	1.90@ 2.00 100 lbs.
Casein, in bags, clf. N. Y.	10c. per lb.	.22@ .25 per lb.
Soda ash, light, 58%, in bags	1.50 100 lbs.	1.50@ 100 lbs.
Caustic soda, 76%, solid, in drums	3.25 100 lbs.	3.25@ 100 lbs.

In order to fully appreciate the significance of some of the above price changes, it is necessary to consider other factors which affect the market of the respective commodities.

Casein Has Held in Strong Demand

The situation on Casein has been very critical for the past six

to eight months. Paper manufacturers are receiving approximately two-thirds of their requirements of this important raw material from foreign sources, mainly Argentina. For the past few years, due to unusually dry seasons in Argentina, Casein producers have been forced to cut down the volume manufactured and exported to the United States. Due to the uncertainty as to the tariff rate on this milk product, buyers held off contracting for their future needs, and in the meantime a good portion of the normal exportation to the United States was diverted to European countries. Prices soared from 10 cents a pound to 25 cents and 30 cents per pound for spot material. Casein still continues to be a much wanted commodity and it is hoped that with the coming of warm weather increasing domestic production will alleviate the present demand.

Reduced Production Makes Salt Cake Scarce

Due to a greatly reduced production of the acid of which Salt Cake is the by-product during the past twelve months, a noticeable scarcity of available tonnage of Salt Cake has developed, and manufacturers have raised their ideas of price considerably for both spot and forward shipment. The same situation prevailed both in Great Britain and on the Continent where the production of sulphate has been much below normal for the past two years, making it difficult for them to supply their usual consumers, and greatly increasing the market price. The heavy demand for Salt Cake from the glass industry, the conversion of a good portion of production into Glauber Salts and Anhydrous Sodium Sulphate for use in the dyestuff industry, and the absorption of all available tonnage by kraft producers, who are experiencing a heavy demand for their product, due to the Scandinavian strike situation, are all factors which seem to indicate that during the balance of the year a continued scarcity of Salt Cake will be felt.

Prices Lower on Papermakers' Alum

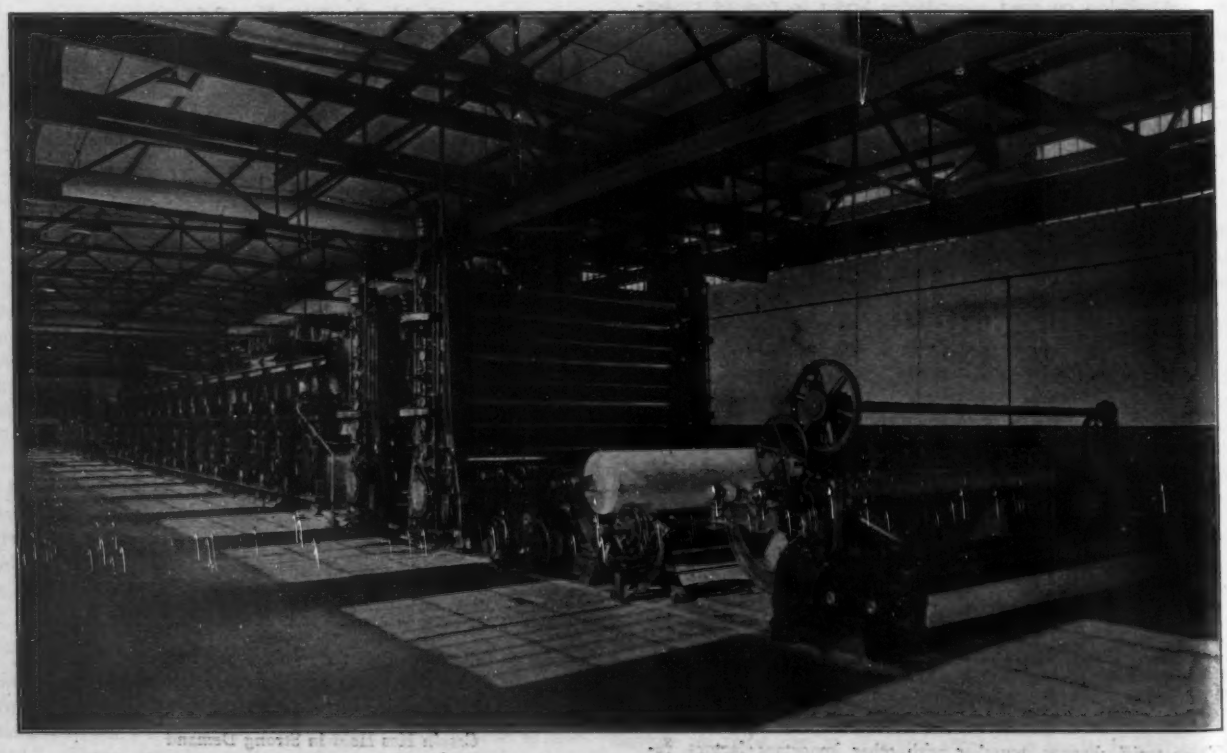
Sulphate of alumina is one of the most important chemicals used in connection with the manufacture of paper. Prices have dropped somewhat in the past year, despite added cost of Bauxite, fuel and labor. More efficient production methods have held costs down and, with the entering into the field of several new alum producers with more improved and up-to-date equipment, a keen edge on competition for Sulphate of Alumina business resulted. Sulphate of Alumina today is actually quoted at a price very close to pre-war levels, but with the present brisk demand for Alum from paper and especially board manufacturers who are specifying maximum tonnages, together with the unusually heavy requisitions from water filtration plants, tanners and dry color manufacturers, it is quite likely that higher price levels will be reached in the near future.

Bleach Has Upward Price Tendency

Market conditions affecting Bleaching Powder are of more than passing interest to the paper maker, on account of the large quantity consumed annually by the paper mills throughout the country. During 1922 manufacturers reduced their price considerably below the 1921 quotations and Bleach is now at what may well be considered a very nominal figure. Some new production during the past two years has tended to sharpen competition, but, on the other hand, many of the important items entering into the manufacture of Bleach have advanced in price within the past few months, and it is likely that the price will be well maintained during the balance of 1923.

Prospects Bright for Balance of Year

For the coming year it is evident that all underlying conditions in the chemical market will certainly warrant chemical manufacturers looking ahead with considerable confidence to the next twelve months at least. The leading chemical consumers, such as steel, fertilizers, paper, textile, tanning and glass industries, are showing marked improvement and are consuming increasing quantities of heavy chemicals, and this will undoubtedly tend to keep the plants working to full capacity.



VIEW FROM DRY END OF NEW BLACK & CLAWSON BOOK MACHINE JUST INSTALLED BY THE P. H. GLATFELTER CO., SPRING GROVE, PA.

Rags and Paper Stock Improved in 1922

Practically All Grades Showed Sharp Advances Which Resulted in a General Buying Campaign Which Condition Still Exists—Although Some Grades Have Shown Slight Recessions in Value the Market Is in Excellent Shape and Is Likely to Continue So for Some Time—If Mills Will Adopt a Policy of Paying Fair Prices for Raw Material It Will Help Greatly in Stabilizing Prices.

Written Especially for the Annual Number of The Paper Trade Journal by Walter R. Hicks, of Daniel M. Hicks, Inc. New York.

When the robins return in the spring, when the circus comes to town and when the major leagues start the season, the annual convention of the paper manufacturers takes place in our great city of five boroughs and five-cent fares.

The fiscal year of the industry is from April to April by the supercalendar.

The year consists of three hundred and sixty-five days, but they do not observe Sundays, holidays nor all the commandments.

Paper makers flock from everywhere to attend this industrial barbecue so they can remove some of the wood pulp from their hair, shake the rag dust from their feet and tinge their strong, unbleached countenances with the crimson hue of good fellowship.

There they can roast each other, exchange costs and pre-Volstead headaches, all for the betterment of the country, the trade and the man.

The convention covers manufacturing, jobbing and raw material and it falls to me to cover the raw end, which, after all, is our end of the business. We will confine ourselves to a study of the market from this angle. If you will momentarily stay the wings of progress and wend your way back over 1922, we will try to briefly outline the situation over that period.

Attitude of Paper Mills

The most disturbing factor in the market today is the position that certain mills take in handling raw material and this position has a telling effect in the purchasing power of the consumers. In volume the paper trade ranks second of the industries of the country. While paper stock is the most humble of commodities, its magnitude lends a certain amount of dignity and makes it an important cog in the wheel. Most of the mills enjoy an excellent standing in the trade and, on the other hand, most of the dealers have kept their skirts from dragging in the mud, but mix-ups and entanglements arise at times between mills and dealers that could readily be avoided by co-operation. For example, old books, roofing rags and manila rope are very hazardous grades to deal in, and the seller is oftentimes confronted with a settlement that results in a resolution not to handle these grades again, at least with certain mills. Balboa may have discovered the Pacific Ocean, but the paper mill chemists have discovered enough water in roofing rags and rope to make the Pacific look like a mill pond. Waste material has never been packed according to chemical analysis, yet it is subjected to chemical analysis by the mills, which is settled for accordingly, and which means a debit made up of moisture, or groundwood outthrows, or something of the sort. Shortweight, excess tare and inferior quality are matters than can be readily dealt with and it is within the scope of the packers to remedy these complaints, but moisture and groundwood content, unless deliberate, is difficult to cope with. It is hoped that the trade associations can draw up specifications that will put all waste commodities on a basis that will permit of its profitable handling and be equitable to all concerned; so much for the market's frame of mind, so to speak, now for its physical side.

While the business improvement in the first three months was a carry-over from late '21, it was the first healthy indication of a sound development. The mills either reduced stock on hand to a minimum, or only bought to cover their current needs. The second quarter shaped up even stronger and practically all grades showed sharp advances, which resulted in a general buying campaign, which condition still exists. Although some grades show slight recessions in values, the market is still and will be for some time in excellent shape.

Waste Paper Most Active

Waste paper was the most active item on the list and all grades scored the highest levels since the boom market of 1920. The board grades were the strongest, showing in some cases a 100 per cent improvement between the low and the high of the year. Mixed papers touched a cent and a half, news a dollar sixty-five f. o. b. New York, kraft soared to two dollars and fifty cents, white blank reached a limit of two-forty. All packings of manilas showed a proportional improvement, No. 1 old realizing two cents per pound and new manilla envelope three cents per pound.

Book and Ledger Stock Improve 100%

Book stock and ledger also responded and the best price obtainable showed a 100 per cent improvement. Books reached three cents and ledger stock did not go much beyond this figure at any time. The better qualities did not fluctuate as much as the lower classes of stock, as there was only about a twenty-five per cent variation in the prices. Hard white bond shavings sold as high as five cents per pound and in some quarters white envelope sulphite brought four and three-fourths cents; soft white reached four cents before it settled back, but at no time was there any great slump in the market.

Advances and declines were orderly and carried an underlying tone of soundness.

Progress Made in New Rags

The new cutting market was in very good shape over the entire year. There was a demand not only for paper making, but also for shredding and shoddy. The white and bleachable grades were the most active, white shirts showing about a forty per cent advance, blue overalls about seventy-five per cent, while fancy shirts and washables did not do so well, due to the fact that the mills required them bleachable, a thing that could not be guaranteed. However, the demand has improved to such an extent that all grades show a decided advance.

Old Rags Were Sluggish

Old rags were the most sluggish of all paper stock, with the exception of roofing rags and fibre rags. The former reaching its present high level of one and three-quarters cents, an advance in domestic stock of about 150 per cent and in case of the fiber grades, such as dirty whites and miscellaneous blues in domestic and corresponding grades in foreign, increased in value all the way from fifty to 100 per cent. Since the first of the present year,

the fine mills have entered the market with greater vim than at any time since '21, and No. 1 old whites, repacked blues and No. 2 whites are coming into their own with the result that prices have moved upward and to every indication will go higher.

Manila Rope Active—Bagging Dull

The story on manila rope is brief. There has been a constant market and the price has been steadily forging ahead. Four and one-half was the low mark and six and three-quarters is the present limit, which is the high over the past twelve months. Bagging has been a positive drug on the market and only the very finest packings have met with any ready sale. Roofing bagging went up about fifty per cent in sympathy with other grades of roofing and the bright remained firm, ranging from one-twenty to one-forty.

Question of Foreign Embargoes

The foreign market was such that in the early days importation was favorable and, with the improvement here, large tonnages were brought over. The effect of this is generally a softening of the domestic market, but as demand continued increasing, values continued on the upward trend. Conditions are shaping up abroad and the home consumption has improved to such an extent that Belgium has placed an embargo on the exportation of rags and France and Germany are curtailing their shipments of stock to other countries. Before this situation developed, it was a question of price; today it is a question of embargoes, and if the home mills want raw material it will not be allowed out at any price.

A Steady, Wholesome Advance

In summing up, we cannot say the market has had the semblance of a boom. It has shown a steady, wholesome advance. The balance sheet presents a chorus of dancing figures in the latest song hit, "When the Red Ink Turns to Black." The year 1922 went beyond the expectations of the most optimistic, and 1923 gives promise of a continued prosperity. If the mills will adopt the policy of paying a fair price for raw materials and encourage their production, it will go a great way toward stabilizing prices, holding in check any runaway market and thereby lessen the likelihood of a disastrous crash, such as we had after the boom of 1920.

P. H. GLATFELTER CO. DOUBLES CAPACITY OF PLANT

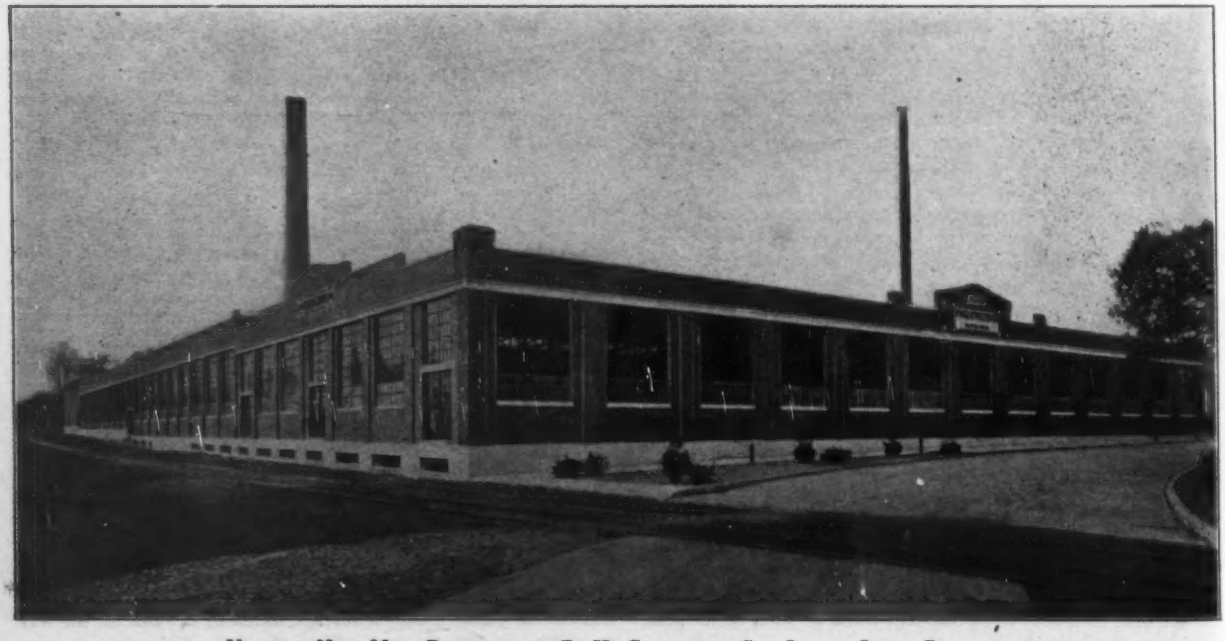
The past year has witnessed the completion of improvements and additions to the mill of the P. H. Glatfelter Company at Spring Grove, Pa., which have resulted in the doubling of its output of book, bond and writing papers. The principal addition was the new Number Five paper machine. The Black-Clawson Company built the 170-inch machine which embodies the latest improvements in Fourdriniers. The drive is the most recent development of the General Electric Company in the sectionalized type of paper machine drive.

An entire new group of buildings has been erected to house the new machinery and to provide storage space for raw materials and additional room in the finishing departments. Approximately sixteen thousand square feet of floor space has been added. The construction of the buildings is concrete, brick and steel with gypsum roofs. The Aberthaw Construction Company of Boston were the general contractors. During the past few years the entire pulp and paper mill of the company have been remodeled and much new machinery has been added.

The production of the mill is now 200,000 pounds of paper in twenty-four hours and consists of machine-finish and super-calendered book papers, bond, writing, mimeograph, drawing and tablet paper.

AUSTRIAN WRAPPING IMPORTS GROW

Exports of wrapping paper from Austria to the United States during 1922 amounted to 6,443,388 pounds, valued at $229,539, a gain of 2,711,545 pounds in quantity and $81,104 in value over the previous year, according to a report to the Bureau of Foreign and Domestic Commerce from the American Consul at Vienna.



VIEW OF NEW MILL BUILDINGS OF P. H. GLATFELTER CO., SPRING GROVE, PA.

Record Breaking Year in News Print in Canada

Mills Turn Out an Output of More Than One Million Tons During 1922—A Seventy Per Cent Increase Judging from Present Development, Will Result Before the End of 1924—Huge Projects Under Way in the Quebec Provinces—One of the Greatest Power Projects in the World Now Under Way at the Grand Discharge, Lake St. John, With Price Bros. and J. B. Duke Interested—Census of Industry.

Written Especially for the Annual Number of the Paper Trade Journal by C. L. Sibley.

Since the last convention of the American Pulp and Paper Association, a marked change for the better has come over the pulp and paper industry in Canada. The crisis caused by the depression after the war may now be said to have definitely passed and with one or two exceptions practically all the companies engaged in the industry have been able to weather the storm and come through it with flying colors. As a matter of fact there never has been a time when the industry as a whole was on a more soundly prosperous basis than at present and everything points to a continuance of progress and development.

Of course, it is in news print that the greatest progress is being made and, although the capacity of the mills has been greatly increased, the market demand has kept pace with the production to such an extent that developments are now being planned that will surpass even those under way or under consideration at the peak of the boom. The only misgiving which is felt here is as to whether the developments under way are not being pushed ahead too rapidly, with the possibility of production surpassing the market demand. In this connection, a warning was sounded at the recent annual meeting of the Canadian Pulp and Paper Association, but almost every day new developments are reported, so that the warning appears to have had no deterring effect.

A Record-Breaking Year

The year 1922 was a record-breaking year from the viewpoint of news print production in Canada. For the first time in history Canadian production was more than 1,000,000 tons. The 1922 output was estimated at 1,086,551 tons, compared with 876,000 tons in 1920, up to that time the highest on record. This compares with the United States' output last year of about 1,448,000 tons. As showing how the proportion of news print produced in Canada is increasing, the following comparisons of production are interesting:

	1922 Tons	1921 Tons	1920 Tons
U. S. Mills	1,448,000	1,225,000	1,512,000
Canadian mills	1,086,551	813,000	876,000
Total	2,534,551	2,038,000	2,388,000

New Mills Under Construction

There are now under construction in Canada two new news print mills—one at Three Rivers, Quebec (St. Lawrence Paper Mills), and one at Fort William, Ont., each with an estimated capacity of 120 tons a day and which will come into production early next year. The Bathurst Company is starting work on a new 50-ton news print mill at Bathurst, N. B. Contracts are reported to have been awarded for the erection of the first unit of a new $13,000,000 pulp and paper plant at Elko, B. C., which will produce 100 tons of news print a day, and, when finally completed, 300 tons. The Brooks-Backus Company has under construction near Kenora, Ont., a pulp and paper mill which it says will eventually be equipped with machinery sufficient to produce 1,000 tons of news print a day, or about twice that of the largest mill now in operation. Two million dollars have already been expended on power development and in the erection of the first mill unit, an 80-ton ground wood mill has just begun operation. The company plans to add a 100-ton news print mill during the year and to continue adding new units until the 1,000-ton maximum is reached.

Two of our older news print mills are expanding with the purpose of adding during the present year at least 260 tons a day to their present productive capacity—the Belgo Paper Company with 150 and Price Bros. & Co., with over 100. The Donnacona Paper Company is adding a new machine which will increase its output by over 50 tons a day. By the end of 1924, it is estimated that Canada will be producing news print at the rate of 1,500,000 tons per annum. This will be equal to 70 per cent of to-day's news print consumption on the North American continent and an amount equal to the total production of United States and Canada in any year prior to 1912.

A Census of the Industry

The Dominion Bureau of Statistics has just issued a preliminary report on the Pulp and Paper Industry of Canada in 1921 which shows the importance of that industry in the Dominion. The following is a synopsis of the report:

Total number of mills 100, comprising 40 pulp mills, 27 pulp and paper mills, 33 paper mills. The distribution of these mills among the various provinces was as follows: British Columbia, 4 pulp mills, 2 pulp and paper mills, total 6; Ontario 8 pulp mills, 13 pulp and paper mills, 18 paper mills, total 39; Quebec, 17 pulp mills, 12 pulp and paper mills, 15 paper mills, total 44; New Brunswick, 5 pulp mills; Nova Scotia, 6 pulp mills.

Total capital invested $378,812,751, distributed as follows: Quebec, $171,477,753; Ontario, $139,666,276; British Columbia, $39,152,821; New Brunswick, $23,394,271; Nova Scotia, $6,121,630. The total capital invested in 1920 according to the Census Report was $347,553,333, so that 1921 shows an increase of $31,259,418.

The total number of employees including executives, technical experts, clerical help and mill employees was 24,611 of whom 21,480 were employed in the provinces of Quebec and Ontario. The total salaries and wages paid was $34,199,090, distributed among the various provinces as follows: Quebec, $16,726,716; Ontario, $12,952,889; British Columbia, $3,205,429; New Brunswick, $1,151,229; Nova Scotia, $162,827.

In all mills making ground wood pulp there were 674 grinders with a 24-hour capacity of 4,808 tons, or a yearly capacity of 1,320,344 tons dry weight and using 343,544 H. P.

In all chemical pulp mills were 159 digesters with a yearly capacity of 1,039,866 tons.

In all mills making paper there were 110 Fourdrinier machines with a 24-hour capacity of 3,945 tons, or a yearly capacity of 1,398,766 tons.

Total consumption of wood was 2,180,578 cords valued at $38,283,262, giving an average cost of $17.55 per cord. This amount consisted of spruce 1,499,478 cords; balsam, 511,791 cords; hemlock, 122,997 cords; pine, 40,406 cords; poplar, 3,557 cords and other kinds; 2,349 cords. Distribution by provinces was as follows:

Province	Cords	Cost at Mill	Aver. Cost
Quebec	1,111,277	$19,657,326	$17.68
Ontario	700,589	13,378,019	19.09
British Columbia	225,240	3,482,007	15.45
New Brunswick	121,110	1,518,784	12.54
Nova Scotia	22,362	247,126	11.05
Total	2,180,578	$38,283,262	$17.55

In addition to the quantity consumed at the mills 1,092,553 cords, valued at $14,617,610, were exported.

Huge New Project for Quebec

As far as Quebec and the Maritime Provinces are concerned, undoubtedly the most important development of the year is the one in which Price Bros. & Co. have joined with James B. Duke for the development of power at the Grand Discharge, Lake St. John. This power development is being undertaken with a view to increasing the capacity of Price Bros. news print mills from 300 tons of news print per day to 900 tons. It will make this company the largest manufacturers of news print in the Dominion. Work has already started on the development of the power which will ultimately develop 1,500,000 h.p. at the head of the Saguenay river.

There will be two power plants—one at the head of the river at Lake St. John, furnishing about 500,000 h.p. and the other in another site which would supply the additional 1,000,000 h.p. This site is about 22 miles from Lake St. John. The magnitude of the enterprise may be judged from the fact that the Ontario Hydro-Electric Commission scheme, with present improvements completed, will be only 250,000 h.p. from the two present plants at Niagara Falls, and 500,000 more from the Chippewa Canal work. The work is being carried out by the Quebec Development Company, formed by the Duke-Price interests, with a capitalization of $25,000,000 all of which has been subscribed by James B. Duke, who is president, and Sir William Price, vice-president.

Where the swift waters of the Saguenay rush past Isle Maligne 500,000 h.p. will be developed and 1,000,000 more at Shipsaw, the second station. Independent of the cost of the site, some $15,000,000 will be invested in the Isle Maligne station. The whole cost is estimated at $75,000,000, though eventual development may run to three or four times that sum. Plans call for the development of the Isle Maligne Plant within three years, but Mr. Duke thinks ten, or even twenty, may elapse ere it is fully developed. Lake St. John, in which the Saguenay rises, covers an area of 350 square miles at low water and 400 square miles at high. Fed by five large rivers and as many small, it has an ample supply for all seasons of the year. The Saguenay flows out through a rocky gorge. Between the lake and Isle Maligne, where it is proposed to erect the first of the two great power houses, a distance of seven miles, the fall is 100 feet. The river flows on in a broad, turbulent stream, passing piles of perpendicular rock, some of which are 2,000 feet high, to the point, about 20 miles distant, where the second and larger power house will be located. Seven miles farther down still is Chicoutimi, the head of navigation, from which large vessels may proceed down to the St. Lawrence and thence to all ports.

In addition to supplying power for a large extension of the Price news print mills, it is planned to establish a large chemical industry in Quebec. The manufacture of chemical fertilizer in the Southern States is assisted by power from the Southern Power Company, in which the tobacco magnate is a high official. He thinks that phosphate rock from Florida might be economically brought by boat to Quebec, and roasted in the electric ovens on the Saguenay for the manufacture of fertilizer on a large scale.

St. Maurice River Development

Another large project for the development of hydro-electric power is now under way in the province of Quebec. This is the harnessing of the famous Gres Falls and Gabelle Rapids of the St. Maurice river, controlled by the Shawinigan Water & Power Company, Limited. This development has been made necessary by the new paper mills established on the St. Maurice. It is provided in the plan of development which has been mapped out by the Shawinigan engineers, that a concrete dam will be erected which will have a length of 1,547 feet, extending across the river. Installation will involve four vertical type turbines, and generators each having a capacity of 30,000 h.p., providing a total installed capacity of 120,000 h.p. There will be room provided in the power house for installation of two additional units. Through its advantage of ownership of the flow of the waters, the St. Maurice Company will be permitted to use the full pressure at the points in question. The location will also have the full advantage of the huge Gouin storage dam, the third largest of its kind in the world, which has successfully regulated the flow of the river since it was first brought into operation.

The Conservation of Water

The great success which has attended the projects carried out by the Quebec Government for the conservation of water on the principal power rivers of the province, and notably on the St. Lawrence river have decided the Government to go ahead with plans which will ultimately provide water storage reservoirs on practically every important river in the province. The latest plan to be put into effect by the Provincial Government is awarding of the contract for building a dam on the Chicoutimi and Sable rivers at Kenogami. Work has already been started by the successful tenderers, the Nova Scotia Construction Company. The total cost will be about $1,000,000. The dam will increase the power supply for the pulp and paper mills of the district.

Reduction in Timber Dues

In order to encourage the clearing of burnt timber and timber destroyed by insects during the past winter, the Quebec Government reduced the timber dues on such areas to $1.75 per thousand feet, board measure, for white pine; of $1.50 per thousand feet, board measure, for red pine, elm, ash, basswood, maple, birch, and tamarack, and of $1.25 per thousand feet, board measure, for spruce, balsam, gray pine, hemlock, white birch, aspen, cedar, etc.

Increase in Value of Timber Limits

With the rapid development of the pulp and paper industry it is but natural that the price of timber limits should be soaring. Early in the present year, a new record in this direction was established. On the sale of timber limits on the north shore of the St. Lawrence to the Ontario Paper Company, of Thorold, operated by the *Chicago Tribune*, the price was quoted to be $3.35 per square mile instead of $3.35 per thousand feet, this being, of course, as stated, in addition to the stumpage tax now imposed of $2.70 per thousand feet, a total of $6.05. Forestry engineers figure out this price as practically doubling existing prices paid on Government limits, and as a result very important changes may be made in the near future in re-valuing limits held by the pulp and paper concerns. In place of the old cost of $1,500 a square mile the basic cost was reduced to $400 but the increased stumpage dues work out at $6.05 per 1,000 feet or $3.02½ a cord, compared with $1.40 a cord, the old rate. A cost of $400 per square mile is equal to 6½ cents per cord, as compared with $1,500 a mile or 25 cents a cord. The new stumpage raises the 6½ cents to $3.09 per cord compared with the old rate of $1.65 per cord. Thus the valuation now set on the pulpwood in the form of standing timber is over $2,500 a square mile. The increased stumpage will mean in excess of ten millions of dollars extra for the one limit of 2,000 square miles providing there are no bad burns in future on the limit.

Paper Industry in Ontario Is Expanding

Paper Manufacturers and Paper Merchants Did Better Business Than They Expected to Even at the Lower Prices in 1922 and Concluded a Satisfactory Year—Fort William Paper Co. Starts Manufacture of News Print at Fort William—New Book Paper Plant of the Provincial Paper Mills at Port Arthur to Cater Especially to the Requirement of Western Canada—Outlook Is Encouraging.

Written Especially for the Annual Number of the Paper Trade Journal by G. W. Brock.

The paper business has been fairly prosperous in Ontario during the past year. Most of the manufacturing and distributing concerns did a great deal better business than they expected, even at the lower values and the turnover in numerous cases showed a gratifying gain. Several plants are now extending and most mills are running to capacity. Others are contemplating extensions and the future is promising. There are no pessimists in the ranks of the pulp and paper men and, with business expanding, there is little fear but that 1923 will prove a satisfactory one with the majority of firms. Conservation and stabilization are the slogans of the industry at the present time.

Pulp mills are now operating to good advantage so far as the demand for their output is concerned, and coating paper plants are busier. Specialty mills are active and book mills are well employed. Manufacturing stationers and paper box makers, wrapping paper producers and toilet and tissue plants all report the outlook as favorable. The next nine months should, unless all signs go by the board, result in things getting continuously better and better.

A Rich Pulp Wood District to Be Tapped

In northern and northwestern Ontario, with the extension of the Temiskaming and Northern Ontario railway from Cochrane to James Bay, which work is now under way, a rich new pulpwood territory will be tapped. This will result in more plants being established further north than they are at the present time and other new pulp and paper towns springing into being.

According to figures compiled by the Department of Lands and Forests for Ontario, there was cut in the province off Crown lands during the past year 289,113 cords of pulpwood and 309,000,000 feet of lumber. The area covered by timber operators under license was 17,289 square miles. There will be a larger harvest of pulpwood taken off private lands by settlers and contractors during the coming season than at any period within the past two years. The stocks of some mills in the wood line are getting pretty well down and higher prices are bound to prevail in the near future. Several new concerns have been organized to take out pulpwood and install rossing plants. The demand for poplar is increasing all the while and not a few American organizations have during the last eighteen months started cutting in New Ontario.

Operations of the Hammermill Paper Co.

The Hammermill Paper Company of Erie, Pa., has secured a large part of its raw material in Ontario. Some twenty years ago a Canadian subsidiary of the parent company, known as the Hammermill Pulp and Lumber Company, Limited, was organized for the supplying of the Erie concern with wood. Last year this Canadian organization bought in the Thunder Bay district and exported from the head of the Great Lakes 45,000 cords of pulpwood at a cost F. O. B. vessel of about $12 per cord. There was thus dispersed over half a million dollars. About 25 per cent of the wood exported was purchased direct from settlers on timbered lands. It is expected the company this season will take out 70,000 cords, and in doing so will expend a million dollars. For shipping purposes ten vessels are kept busy during the summer and when logging operations are at their highest some 1,500 men are employed.

Fort William Paper Co. Expands Mechanical Pulp

One of the new concerns, which started operations during 1921 in producing mechanical pulp, was the Fort William Paper Company with headquarters at Fort William. This firm, which for over a year has been operating a ground wood plant of 125 tons production, branched out early in 1923 in the making of news print paper. Col. Thomas Gibson is president of the company; George H. Mead chairman of the board of directors, and D. G. Calvert resident manager and treasurer. The capacity of the plant is 120 to 130 tons of news print daily. The second machine was recently put in operation.

The turning out of news print at the head of the Great Lakes marks an important era in that it is the first paper of its kind to be produced in that vast territory. It marks an epoch in the history and development of the district which is bound to have a great influence upon the future welfare of Fort William as a pulp and paper center.

The Fort William Paper Company was organized in 1920 and active operations began early in the next year. It is understood that if certain timber concessions can be obtained from the Ontario government, the company is considering the advisability of doubling its ground wood output. The company secures its pulpwood from individual contractors, private bushmen, farmers, settlers and others, as well as taking out a large quantity on its own behalf. An aggressive woods department is maintained.

New Book Mill of Provincial Paper Mills

Another important factor in the development of the Twin Cities—as Fort William and Port Arthur are known—was the establishment of the new million dollar book mill of the Provincial Paper Mills of Toronto. Five years ago the company built a pulp mill at Port Arthur, which turns out about 60 tons of sulphite daily and has been an important factor in the expansion of Port Arthur. Last year construction started on the new book paper mill, and good progress was made on the work. This mill will cater especially to the paper requirements of Western Canada, and is the only plant of its kind between northern Ontario and Vancouver. The output is about 35 tons a day and a number of specialties will be made. At present one machine is installed but ample provision has been made for placing another in position when the requirements of the market render such a step advisable. The machine turns out a sheet of 136 inches trim, and was built and installed by the Dominion Engineering Company of Montreal. The company also built a 15-ton ground wood mill which will supply the mechanical pulp for its book mill and it is the intention in the future to erect a soda pulp plant of about 40 tons capacity.

The new paper mill is two stories high and the whole mill is 575 feet long and 72 to 147 feet wide. Included in the huge plant are a finishing room 147 x 30, machine room 270 x 79, beater room 65 x 79, clay and size room 38 x 79, screen room extension 109 x 65, sub-station 26 x 56, boiler house extension 47 x 52. There is also accommodation for four boilers but at present only two have been installed.

The engineers for the new plant are H. S. Taylor, Limited, of Dayton, Ohio, and Montreal, and the contractor for the building was W. J. Trimble, of Toronto.

Thunder Bay Paper Co. Improvements

Extensive improvements have been made by the Thunder Bay Paper Company, Limited, at Port Arthur, of which F. N. Youngman is manager. This plant was formerly operated by the Kaministiquia Paper Company and early last year was purchased by the Consolidated Waterpower and Paper Company, of Wisconsin Rapids, Wis. The name was subsequently changed to the Thunder Bay Paper Company.

In April last the mill had only an output of 35 tons of ground wood a day, and now production is up to 60 tons. A new wood room of brick construction, 104 x 60 feet, was erected. Two 9 x 30 feet steel barking drums, supplied by the Canadian Barking Drum Company of Toronto, were installed, and sufficient space was left for placing in two more drums. An 84-inch wet machine, manufactured by the Port Arthur Shipbuilding Company, and a new hydraulic press made by the Hydraulic Machinery Company, Montreal, were also placed in position as well as three new 1,000 horsepower motors. The latter, which were manufactured by the Canadian Westinghouse Company of Hamilton, replaced three 450 horsepower motors. Larger transformers took the place of several small ones. New Sherbrooke screens were also installed. The power used is 3,000 horsepower and the company has 16 acres of ground, which is ample for future extensions. The output of the mill is at the present time being shipped by rail to Wisconsin Rapids.

Much Pulp Wood Cut

During the past winter there were one hundred and eighty thousand cords of pulpwood cut in the Port Arthur-Fort William district and over two thousand men employed. Nearly all the bush work done now is by the piece and contractors pay labor two dollars and fifty cents for each cord of pulpwood cut. The Fort William Paper Company employed two hundred men in its camps during the past season and took out thirty thousand cords of pulpwood along the Grand Trunk Pacific railway. Other contractors and firms were as follows: Thomas Falls, at Shabaqua, ten thousand cords; J. Greer, along the Grand Trunk railway, ten thousand cords; Provincial Paper Mills, Limited, at Sibley, thirty thousand cords; the Stevedore Company and G. E. Farlinger, at Nezah, ten thousand cords; Scott Lumber Company, at Current River, ten thousand cords; Charles W. Cox, at Nipigon and Black Bay, twenty-five thousand cords; Thunder Bay Paper Company, supplies from local farmers, fifteen thousand cords; Detroit Sulphite Company, who have a yard at the Mission site, Fort William, ten thousand cords; Russell Timber Company, at Hurkett, thirty thousand cords.

This makes a total of one hundred and eighty thousand cords of pulpwood, besides which there were twenty thousand piling taken out and a million and a half railway ties. The past winter was an ideal one for bush operations. The steady, cold weather made camp conditions all that could be desired and the liberal snowfall rendered it safe to assume that there would be lots of water this spring to carry the wood down into Lake Superior and Thunder Bay for booming or shipment to the mills.

Glengarry Pulp Co. Formed

Recently the plant of the Cornwall Pulp and Paper Company, at Cornwall, Ont., which had been in financial difficulties for some time, was taken over by the Glengarry Pulp Company, in which Toronto men are interested. C. J. Shepherd is the manager of the company. The capacity is about thirty tons a day of bleached and unbleached ground wood and the mill will be put in operation and employ a large number of hands.

Backus-Brooks Co. Starts Mill at Kenora

The new pulp plant of the Backus-Brooks Company, of Kenora, Ont., is now in operation and in a few weeks work will be commenced on the excavations for the big paper mill. It is estimated that about $2,000,000 has been expended by Mr. Backus' organization in the development of power and in the erection of the 80-ton ground wood mill which represents the last word in construction and layout.

There is an ample supply of pulpwood to keep the industry going for many years, Mr. Backus having secured from the Ontario government 3,000 square miles of the English River concession. This area contains many thousand cords of wood and the supply of the mill will come from the Lake of the Woods through a long sluice into Rideout Bay. A conveyor takes the wood from the water to the slasher table where it is cut into four-foot lengths and then goes into the barker. The barked wood is carried to the storage room over the top of the magazine grinders and is stored for use when the wood room is not operating. There is sufficient space for enough wood to run the mill twenty-four hours a day.

In the grinder room are four standard Waterous magazine grinders and each pair is driven by a 2,800 horsepower synchronous motor. The motor is direct-connected to the two grinders, being situated between them. This is a great convenience and an economical arrangement, as when repairs or replacements of stones are necessary, the grinder can be uncoupled and the other unit operated. From the grinders the stock flows by gravity to the rotary, outward flow type bull Hymac screen.

In the wet machine room there are eight 84-inch Waterous wet machines and two 86-inch Dominion machines, and four Southwark 600-ton hydraulic presses. Two Nash vacuum pumps supply the vacuum for the wet machine vacuum boxes.

Dryden Paper Co. Improvements

Another concern that is expanding is the Dryden Paper Company, Limited, of Dryden, Ont., of which W. A. Black, of Montreal, is president, and F. A. Sabbaton, for many years associated with the Laurantide Company, is vice-president and general manger.

A great many improvements are being carried out to the plant. These include a waterpower development of 1,400 horsepower at a convenient distance from the main plant, a paper machine capable of making a variety of paper, a ground wood unit to enable new lines of paper to be made and the necessary beater and other equipment to round out the whole plant. The new power development is at Wainwright Falls on the Wabigoon River. The dam is of solid concrete construction, 300 feet long with 150 feet of spillway.

It may be stated that the extensions to the paper mill are all of reinforced concrete and brick. The grinder room is 50 by 25 feet and the switchboard and motor room of the same dimensions. The grinder room contains two Waterous, three-pocket magazine grinders which are direct-connected to synchronous motors.

In the beater room, which is 98 x 120 feet, and consists of a main floor and basement, are installed ground wood screens, decker and wet machine, and five beaters, four being Jones and one Waterous. Each beater is driven by individual motor, with a capacity of 100 horsepower each.

The machine room is large, being 210 feet in length and 84 feet wide, and ample space has been left for putting in another machine when required. A 130-inch Yankee paper machine, built by the Beloit Iron Works, Beloit, Wis., is being installed. This machine, which has a drum reel and winder, is equipped with a P. A. P. A. screen built by the Dominion Engineering Works, Montreal, and a Jones Jordan refining engine, with direct motor drive.

An extension has been built on the finishing room, 140 x 84 feet, and other new buildings include a train shed and a storage warehouse, 210 x 40 feet. In the steam plant extension there are installed six 200-horsepower return tubular boilers, equipped with MacLean underfeed stokers.

Alongside of the dam a new pump house is being built. Each of the two direct-connected, motor-driven centrifugal pumps will have a capacity of 2,000 gallons.

Improvements to the sulphate pulp plant have been made by an extension of the diffuser wash-room building and the installation of two new diffuser wash tanks; also, an addition to the chemical recovery-room building, and the installation of a lime sludge filter.

The capacity of the Dryden mill will be about 75 tons of sulphate pulp daily, of which two-thirds will be converted into light and heavy wrapping papers and suphate pulp paper, for which there is a good demand at present owing to the active construction campaign being carried on in all the larger cities.

During 1922 the company spent a large amount of money in plant additions and repairs, and the added facilities will greatly improve the efficiency of the organization, which lately underwent some changes in the board of directors, and is now headed for profitable operation and enlarged production.

Other Improvements in Ontario

Noted below are a number of other extensions completed or under way in Ontario, or proposed additions to the pulp and paper industry.

The Spruce Falls Company erected a new sulphite plant at Kapuskasing, Ont., equipped with four 30-ton digesters and is now operating to capacity. The product is being taken at the present time by the Kimberly-Clark Company, of Neenah, Wis., for its various mills. A 150-inch pulp-drying machine is also being installed.

The plant of the Mattagami Pulp and Paper Company at Smooth Rock Falls, Ont., is running to capacity and finding a good market for its output of sulphite pulp, which is about 150 tons daily.

The Strathcona Paper Company, of Strathcona, was incorporated with a capital stock of $600,000, and during the year installed a new board machine for the making of chip, pulp and solid news board. The capacity is 30 tons a day from 15 up to 60 point.

The Frankford division of the Canadian Paperboard Company erected a new ground-wood mill, with a capacity of 20 tons a day, and carried out several other improvements to the plant.

The Allen Paper Company, Simcoe street, Toronto, doubled its warehouse capacity during the past year and took aboard several new lines.

The Belleville Paper Company, Belleville, installed new steam boilers and made other alterations which increased the output in straw and chip paper for corrugating purposes and pleated carpet lining.

The pulp plant of the Beaver Board division of the Beaver Products Company at Thorold, Ont., resumed operations, after being shut down for many months.

The Great Lakes Paper Company will erect a large paper mill at Fort William. L. M. Allsted is at the head of the organization and delay in starting construction has been occasioned in arriving at a satisfactory power arrangement. An agreement has now been concluded with the Hydro-Power Commission in the Nipigon development plan, which provides for the sale to the company of 22,000-volt power at $18 per horsepower per annum delivered at the plant. The company will expend $2,000,000 within the next three years.

The three plants of the Spanish River Pulp and Paper Mills, which are located at Sault Ste. Marie, Sturgeon Falls and Espanola, have reached the record production of over 700 tons daily in news print, making this concern the second largest producer in the world, while the Abitibi Power and Paper Company, whose mill is at Iroquois Falls, Ont., has speeded up manufacture until nearly 500 tons daily of news print is the result. This is the largest individual unit on the continent located under one roof.

The Garden City Paper Mills Company will erect at St. Catharines a new mill, and a 90-inch Harper Fourdrinier machine will be installed to make wood and stock papers. These will be of the light weight variety. The land and water power have been acquired and the plans prepared for the new plant. L. H. Gardner is the president of the company and C. V. Syrett, of Toronto, secretary.

The Temiskaming Pulp and Paper Company erected a new ground wood mill near Haileybury, Ont., which began operations last summer, and the output is 40 tons daily of ground-wood fiber. The building is 270 feet long by 60 wide and the equipment is electrically driven.

St. Lawrence Paper Mills, Three Rivers, Que., Recently Placed in Operation

British Paper Trade Recovers Late in 1922

In Spite of the Considerable Betterment that Took Place in the Industry During the Last Quarter, the Year as a Whole Will Always Be Accounted a Lean One—Much Encouragement Is Found in the Export Returns for January of This Year, When There Was a Pronounced Increase in Over Sea Sales—Outlook in General Was Said to Be Distinctly Encouraging for the Entire British Paper Industry.

Written Especially for the Annual Number of the Paper Trade Journal by Wm. Badminton, Acting Editor, The Paper-Maker and British Paper Trade Journal

The story of the British paper industry during 1922 is the result, as one writer put it, of "a courageous policy initiated at an earlier critical period." At the beginning of the year our paper trade was still in a paralyzed state, not yet having recovered from the slump of 1921, when manufacturers, having booked forward contracts for raw materials at high prices, were confronted by foreign competition and low prices, the latter due chiefly to the rate of exchange. Orders which had hitherto been placed at home were going abroad, the consequence being that unemployment and short time began to prevail.

This condition of things, be it said to the credit of the British papermaker, was resolutely faced, and, ignoring the high cost at which they bought their raw materials, they fixed prices on lower and non-paying levels. Thus they to a very large extent recovered control of the home market while recultivating the colonial and foreign markets. Success did not come quickly, however, and even now makers of the finer grades of paper have little cause for satisfaction. Generally speaking, for nearly two years British paper mills have had an anxious time, culminating, in many instances, in balance sheets which afforded little or no gratification to shareholders. The experience of the paper trade during the first three-quarters of 1922 gave neither manufacturers, nor merchants, nor agents cause for elation, and, notwithstanding the later improvement of the position, 1922 may be accounted a lean year.

The Home and Foreign Trades

Statistics as to home markets do not exist in public form, but reports and balance sheets of the limited liability companies in the paper industry speak for themselves. Many instances occur to show that the paper trade in 1922 was tragically depressed for the first nine months, and many regard last year as the worst ever known in the history of the home paper trade. It is, however, the Government returns of exports which constitute the principal thermometer of trade. The gradual process of recovery of the British paper export trade is illustrated in the following figures, relating to exports of printings (not coated, but including news), writing paper, and packing and wrappings for the four quarters of 1922 compared with the corresponding periods of 1921:

	1922 cwts.	1921 cwts.
Three months ending March 31	292,489	312,862
Three months ending June 30	388,711	191,260
Three months ending Sept. 30	568,909	248,024
Three months ending Dec. 31	866,479	429,782

As already indicated these figures apply only to the three main classifications of these designated "articles wholly or mainly manufactured" under the heading of "paper, etc.," which also embraces tissue, coated papers, stationery, paper bags, boxes and cartons of paper and cardboard, millboard, strawboard, cardboard, playing cards, and "other manufactures of paper not elsewhere specified." Inclusive of these the grand totals of exports of paper, cardboard, etc., for the twelve months ending December 31, 1922 and 1921 were 2,455,022 cwts. and 1,463,420 cwts. respectively.

Year Will Be Accounted a Lean One

Reverting to the figures for the four quarters of 1922 and 1921 they show that the quantities for last year were approximately double those of the year 1921, which may be considered a "zero" year. Nevertheless, the experience of the paper trade during the first seven or eight months of 1922 afforded no cause for elation, and, notwithstanding the later improvement, the year will always be accounted a lean one. During the greater part of 1922 most mills were operating at half their capacity, while some were intermittently closed down. In January 6,713 out of a total of 61,000 workers were drawing unemployment pay from the Government Labor Exchanges, but this number gradually decreased to 5,086 by the end of June and 4,391 by November. In addition, 4,902 were drawing pay for partial unemployment in January, a number which fell to 336 in October. During the last two months of the year encouraging signs of a revival in the paper trade were noted, for in November exports of paper and paper manufactures amounted to 15,350 tons, or more than double the quantity for the corresponding month of 1921 and the largest for any month since before the Great War. The approach to normal conditions is further indicated by the total quantities exported during the last three years and those for 1913:

	1913	1920	1921	1922
Tons	174,945	117,506	73,171	122,751

Bad as conditions have been during the year, the figures for 1922 constitute a good augury for the future, though the British paper trade has still much leeway to make up if exports are to exceed the level of 1913.

"Trade Within the Empire"

The slogan "Trade Within the Empire" is as yet only partially realized, but it is noteworthy that of 1,499,210 cwts. of printing paper (mainly news) 1,138,524 cwts. and of 171,460 cwts. of writing paper 139,070 cwts. went to countries coming within that category. Australia leads the way with a total of 714,287 cwts., British India following with 209,468 cwts., others in closest attendance being New Zealand and British Africa. A favorable factor in the increased demand for both classes from Australia, which was but 325,589 cwts. in 1921 and 259,322 cwts. in 1920, has been the preferential tariff granted to Great Britain. That exporters hope to maintain their hold upon the Empire markets and to increase it in others is natural, and in this much encouragement is found in the export returns for January of this year, when there was a pronounced increase in overseas sales. Indeed, the exports of paper for January, 1923, amounted to 335,271 cwts., being 43,597 cwts. above the monthly average of 1913.

Imports for the Year

During the twelve months ending December 31 last imports of paper, stationery, etc., totaled 11,071,879 cwts., of which 3,832,358 cwts. under the designation of (a) "Printing, not coated, and Writ-

ing Paper in large sheets"; (b) Packing and Wrapping, including Tissue Paper, 2,818,436 cwts.; (c) Coated Papers, 97,475 cwts.; Stationery, 42,114 cwts.; Millboard, Leather Board, Cardboard and Pasteboard, 879,182 cwts.; Strawboard, 2,966,880 cwts.; Other sorts, 435,434 cwts. Of paper coming under the classification "(A)," newsprint being the larger part, Newfoundland and Coast of Labrador (1,108,757 cwts.), Norway (649,291 cwts.), Sweden (573,219 cwts.) and Canada (189,681 cwts.) were the principal sources of supply, Germany (93,761 cwts.) and the United States (78,545 cwts.) following. Under "(B)" Sweden is far ahead, with 1,058,478 cwts., Norway coming next with 641,514 cwts., Germany with 381,901 cwts., Finland with 282,740 cwts. and Canada, 116,876 cwts. In Coated Papers "(C)," Germany takes the lead, with 37,481 cwts., Belgium being next, with 21,779 cwts. It is worthy of note that from countries having depreciated currency supplies of low-priced paper have not been excessive, as was at one time feared, Germany, for instance, being about 70 per cent below her pre-war figure. How long it will be before Germany becomes a more formidable competitor to the British manufacturer it is impossible to say in the present condition of affairs.

Imports of Raw Materials

Imports of raw materials—chemical and mechanical pulps, esparto and rags—amounted in the gross to 1,084,893 tons, a monthly average of 92,513 tons, compared with 56,141 tons in 1921 and 102,429 tons in 1913. Of unbleached cellulose Sweden was the chief supplier, with 185,239 tons, Norway and Finland following, with 48,606 tons and 46,903 tons, respectively. Imports of moist mechanical amounted to 554,638 tons, Norway supplying 268,718 tons, Canada, 144,656 tons, and Sweden, 116,579 tons. In this connection it should be noted that during the first six months of the year Sir Frederick Becker effected a contract with the Saguenay Pulp and Power Company, on behalf of a group of British paper mills, whose supply of chemical and mechanical pulp for 10 years ahead will be assured. The monthly averages of imports of all raw materials are conveniently set out as follows:

Description	1913 Tons	1921, Tons	1922, Tons
Chemical wood pulp	34,317	18,192	30,014
Mechanical wood pulp	47,163	30,946	47,121
Esparto	17,080	6,119	14,281
Rags	2,461	762	897
Other materials	1,408	122	200
Total	102,429	56,141	92,513

Employer and Employed

The record of the relations between employer and employed in the papermaking industry during 1922 is one of uniform peace. The third National Agreement between the Employers' Federation of Papermakers in the United Kingdom and the workers' unions is now in operation, after lengthy negotiation. One of the most important alterations was in respect to a compulsory holiday with pay, the granting of holidays with payment being now in the discretion of the employer. An automatic sliding scale for the regulation of rates of pay according to the cost of living is also a feature of the new agreement. Representatives of the employers and employees also met on the Joint Industrial Council, which has taken joint action in connection with workers' education, and other subjects calculated to improve the knowledge and promote the safety of the workers.

The Paper Makers' Association

A review of the work of the Paper Makers' Association during the year appeared in the January number of *The Paper-Maker*, which stated, *inter alia*, that substantial concessions had been obtained in respect of paper-making materials in the course of negotiations with the Railway Rates Tribunal regarding the new classification of merchandise; that great progress had been made in the redrafting of the wood pulp contract note, a round table conference, at which the association, the British Wood Pulp Association, and the Wood Pulp Associations of Sweden, Norway and Finland were represented, having agreed to the main outlines; and that another activity which had taken shape was the establishment of a monthly confidential bulletin to members, in which full information is given as to the operations of the various committees, confidential information as to negotiations, etc., and a full analysis of the imports and exports of paper compiled for the association by H. M. Customs.

During the past few years the Paper Makers' Association, under the ægis of its secretary, A. W. Foster, has become a live organization, with enlarged and extended operations. Perhaps one of the most important and useful departures has been the formation of a Technical Section of the Association. This has been in existence over three years, and in 1922 two general conferences and fourteen local conferences distributed among London, Manchester and Aberdeen, were held. The membership consists of papermakers, paper mill engineers and chemists, and, as a rule, the meetings are well attended, instructive papers are read, and useful discussions take place. An exhaustive technical library is in course of formation; all the technical journals on paper-making in the world are filed in the association's offices, and a monthly bulletin, containing full abstracts of all important European and Continental technical articles is now being issued. The association is also arranging for the publication in the United Kingdom, America and Canada for Dr. Sigurd Smith's book on "Beating."

Progress in the Industry

Approximately 1,200,000 tons of paper per annum are manufactured in Great Britain, and it is within the range of possibilities that within a few years these figures will be surpassed. Though the "News" and "Wrapping" mills are busy and a good proportion of those devoted to the manufacture of the finer grades of paper are not yet by any means full of orders, it may with truth be said that British paper manufacturers are setting their houses in order to meet the coming struggle. Great enterprises, too, are about to be undertaken. Messrs. Edward Lloyd, Ltd., have already commenced operations for the erection of a new mill in addition to their enormous mills at Sittingbourne, while one of the best-known Scottish mills will, it is rumored, spend a quarter of a million pounds in improvements. In fact, "all the British engineers could tell of schemes now under consideration for placing British mills in a position to compete with the world, so far as up-to-date machinery can contribute to that success," as one authority says.

Among the present "makes" of paper which before the war were not made to any extent, if at all, in this country are krafts and photographic base papers. As to the first-named, British manufacturers are making good headway against foreign competition, despite the advantages which Scandinavian competitors possess. That British papermakers can hold their own, in point of quality, is the opinion of many unprejudiced buyers.

What the Future Holds

What the future holds for the British papermaking industry and trade is in the lap of the gods, but present conditions are distinctly encouraging. Most, if not all, of the news print mills are working at full capacity and those manufacturing common and fine printings and cheap writings are experiencing an improved demand for both export and home markets. Home manufactured wrappings and esparto papers have made a promising start, and perhaps the only "fly in the ointment" is the fact that at the beginning of the present year high-grade writing papers had not yet reached normal production or normal prices. This may be due to consumers having resorted to cheaper qualities when quotations were at the maximum, and the circumstance that prices correspond in January to about double the pre-war level accounts for the slackness of trade in these grades of paper. Generally speaking, however, there is a better tone in the British paper trade than there has been for some time past, and those well able to judge regard the future of the British papermaking industry with feelings of optimism.

Strike Depresses Swedish Wood Pulp Industry

Comes at Time When Market Has Just Been Recovering from Demoralized Condition—Exports of Chemical Pulp from Sweden to America During 1922 Amounted to 441,871 Short Tons, Which Is a New High Record—Industry Suffered Severely Because of Low Prices and Heavy Stocks During Years 1921-22—Production Greatly Curtailed by Strike Which Is Concluded Early in April.

Written Especially for the Annual Number of The Paper Trade Journal

After the almost disastrous drop in the wood pulp market, which started in during the latter part of 1920 and continued over a period of nearly two years, the last part of 1922 is characterized by signs of recovery.

When the general economical condition of the world, especially Europe, is considered, it may seem surprising that a market depressed and demoralized to such an extent as the pulp and paper market during 1921 and partly 1922 could recover so fast. There is no doubt that this is mostly accounted for by the favorable business conditions in America and the gradually increasing consumption of paper in this country.

Sweden, during 1922, made a new record in its pulp exports, because the total quantity of chemical pulp sold and shipped to America for that year aggregated 394,528 long tons, or 441,871 short tons.

Sulphite Pulp

During the first half part of 1922 the Swedish sulphite mills were forced to reduce their output considerably. The amount of stocks carried over from 1921 were bigger than they had been since 1917, amounting to 173,019 tons of easy-bleaching and strong, and 11,885 of bleached sulphite pulp, the total corresponding to 50.8 per cent of the entire output for export during 1921.

It may be mentioned that the output of bleached sulphite pulp in Sweden is not by far of the same importance as the unbleached sulphite pulp, the former being only about 5 to 10 per cent of the latter named grade.

In face of the serious condition referred to, the Swedish manufacturers had to look after means of reducing their stocks, and these means were found partly by reducing the output of pulp for the first half part of 1922, and partly by making the sacrifice of selling the surplus stocks at comparatively low prices.

This worked out entirely according to expectations, and towards the fall of 1922, the Swedish manufacturers had the satisfaction of seeing prices for easy-bleaching and strong, as well as for bleached sulphite pulp, going up again.

The export of sulphite pulp from Sweden during 1922 is distributed as follows:

	Sulphite			Per-cent of entire export
	Bleached	Unbleached	Total	
Great Britain	5,913	180,832	186,745	27.1
France	8,915	69,912	78,827	11.5
Norway and Denmark	1,536	58,468	60,004	8.7
Germany	2,515	15,886	18,401	2.7
Holland and Belgium	5,573	28,374	33,947	5.
Spain, Portugal and Italy	8,738	39,501	48,239	7.
U. S. A.	25,365	205,562	230,927	33.5
All other countries	8,281	23,015	31,296	4.5
	66,836	621,550	688,386	100.
Sold in papermills inside Sweden	2,823	26,307	29,130	
Total shipments	69,659	647,857	717,516	

The prices obtained for Swedish bleached and unbleached sulphite pulp during 1922 were not, however, satisfactory. During the first half part of the year, which could be characterized as the clearing-up-epoch, prices for all grades were much below the costs for which the pulp had been produced, and also, after the recovery of the market, the Swedish manufacturers could not make any money even at the improved prices during the fall. This was partly due to the high standing of the Swedish exchange-rate as compared with the other European countries. As far as the American dollar is concerned the exchange-rate for the Swedish Krona has been almost normal during the greater part of 1922. The gradual improvement of the exchange-rate for pounds sterling which has taken place since about the last half year, will mean a considerable help to the Swedish exports to England, not only for wood pulp but in particular for the timber market. Since about the middle of November, 1922, to January, 1923, prices have been firm at about:

£23 10/– per long ton for Bleached Sulphite Pulp
£15 10/– per long ton for Easybleach Sulphite Pulp
£14 5/– per long ton for Strong Sulphite Pulp

all c. i. f. British ports.

For about the same period prices in the American market were:

4¾ cents per pound ex-dock for bleached sulphite
and 3 cents per pound ex-dock for easybleaching and strong.

At the present time the quotations for unbleached sulphite pulp are about as follows:

	England	U. S. A.	F. o. b. Swedish port
Easy Bleaching	£16 5/–	$3.45	Kr. 265-275
Strong	£14 15/–	$3.30	Kr. 240-250

Sulphate Pulp

The sulphate mills were also running with reduced output during the first half part of 1922 and for the same reasons. The stocks on hand December 31, 1921, were 52,000 tons of bleached and unbleached sulphate pulp, corresponding to 55 per cent of the output intended for export during 1921, or 94,000 tons.

The total actual production during 1922 was 248,987 tons, including 49,289 tons for home consumption, leaving 199,698 tons for export. Including stocks on hand there was consequently a total of about 250,000 tons to be taken care of during 1922, which quantity is approximately divided on different grades as follows:

	Bleached	Easybleach	Kraft	Total
Stock and production	6,000	28,000	216,000	250,000
Sold and shipped	5,000	25,000	187,000	217,000
Stocks to 1923	1,000	3,000	29,000	33,000

The total amount of stocks on hand December 31 were not more than about 16½ per cent of the whole production intended for export, which has not occurred since 1917.

During the first half part of 1922 the sulphate pulp manufacturers of Sweden made an effort to prevent a too heavy drop of the price for kraft pulp in the American market. This retarded the development of the market considerably and caused buyers to

hold back their purchases for several months, which caused anxiety on the part of sellers. In July, after having brought the agreement to an end, the sellers accepted lower prices in order to get rid of their heaviest stocks, after which the market became firmer and almost all of the old stock as well as the new production was sold within a very few months, part of it at prices up to 2.90 and 3 cents per pound ex dock in U. S. A. for kraft pulp and £14 per ton c. i. f. English ports for easy bleaching and strong sulphate pulp.

The outlook for Swedish kraft pulp in the American market seems to be very encouraging for the following reasons:

Stocks on hand in Sweden are very much exhausted and the demand is likely to increase owing to greater use of kraft pulp for making kraft paper and container board.

The output in Sweden is very much reduced on account of 90 per cent of all mills being shut down owing to labor strikes, which are likely to last some time.

Stocks on hand for sale in the spot market are smaller than they have been for many years and seem to be consumed very fast.

The competition with Norway and Finland is bound to be less keen since the exchange for the Norwegian Krone and the Finnish Mark are improving, though slowly, as compared with the dollar.

The stocks of kraft pulp in both of these countries are very small and the costs of production is increasing steadily on account of the high costs of living in these countries.

The English market for easy bleaching sulphate pulp, which has been very quiet during the last two years, is now showing signs of improvement which will take care of a considerable part of the capacity of the Swedish sulphate pulp mills.

Mechanical Wood Pulp

At the end of 1921 the situation for ground wood pulp was comparatively favorable, stocks on hand being about normal for that time of the year and in general there was a good demand for news print.

The year 1922 was consequently looked upon hopefully. Early as in February, however, prices started to go down, which movement was kept on almost until June-July, when they reached the bottom of about 55-58 krone per ton for wet pulp and remained at that level until December, when a sudden rise of about 15 krone for wet and 30 krone for dry took place, this improvement being however, of little advantage to the Swedish mills, the majority of which are situated in the north of Sweden, where the navigation is closed during the winter.

The manufacture during 1922 of mechanical wood pulp amounted to about 88-90 per cent of the normal capacity and the export has been—in spite of low prices—sufficient to keep down the stocks to about the normal.

The improvement of the world-market for ground wood pulp which came in about the fall of 1922 was chiefly caused by heavy demands from America.

Exports of Ground Wood

Export of ground wood pulp from Sweden to U. S. A. has always been very small and, as a matter of fact practically none until 1911, when 9,649 tons dry weight were exported. During the last decade the export reached its peak, 1920 and 1921 with 10,401, respectively, 7,128 dry weight tons of 2,240 pounds.

How Production Has Been Reduced

The Swedish pulp industry suffered severely because of too low prices and too heavy stocks during the years 1921 and 1922. When prices became better and everything was pointing to a greatly needed improvement during 1923 the pulp manufacturers of Sweden got into a still greater trouble because of disputes with their workmen with a strike as a consequence. This strike, which started in gradually during January, has practically affected all chemical pulp mills in Sweden, to such an extent that the production has been reduced as follows:

		Sulphite pulp			Sulphate pulp		
		Bleached	Unbleached		Bleached	Unbleached	
Normal monthly production		6,000	52,000		800	18,000	
Ditto for 3 months		18,000	156,000		2,400	54,000	
		Actual Production					
January	3,091	27,442		222	7,957		
February	55	6,893		...	2,204		
March	60	3,216	7,000	41,335	...	222	2,200	12,361
Loss of production	31/3	14,784	114,665		2,178		41,639
		129,449			43,817		
		173,266					

PRODUCTION OF PAPER BAGS

The Department of Commerce announces that, according to reports made to the Bureau of the Census, the value of products of establishments engaged primarily in the manufacture of paper bags amounted to $41,190,000 in 1921, as compared with $47,264,000 in 1919, and $17,603,000 in 1914, a decrease of 13 per cent from 1919 to 1921, but an increase of 134 per cent for the seven-year period 1914 to 1921. In addition, paper bags were also manufactured in paper mills and as subsidiary products by establishments engaged in other industries to the value of $4,270,000 in 1921, $8,758,000 in 1919 and $3,889,000 in 1914.

Of the 57 establishments reporting products valued at $5,000 and over in 1921, 13 were located in New York, 10 in Ohio, eight in Pennsylvania, four in Wisconsin, three each in Illinois, Maryland and Massachusetts; two each in Indiana and Maine; one each in California, Georgia, Louisiana, Michigan, Missouri, New Jersey, Texas, Virginia and West Virginia.

In December, the month of maximum employment, 4,752 wage earners were reported, and in June, the month of minimum employment, 3,016—the minimum representing 63 per cent of the maximum. The average number employed during 1921 was 3,707, as compared with 4,168 in 1919 and 3,505 in 1914.

The figures for 1921 are preliminary and subject to such change and correction as may be found necessary from a further examination of the original reports.

The statistics for 1921, 1919 and 1914 are as follows:

	1921[1]	1919[1]	1914[1]
Number of establishments	57	70	54
Persons engaged	4,439	5,087	4,158
Proprietors and firm members	18	41	28
Salaried officers	714	878	625
Wage earners (average number)	3,707	4,168	3,505
Salary and wage payments	$5,091,000	$5,838,000	$2,572,000
Salaries	1,615,000	2,175,000	913,000
Wages	3,476,000	3,663,000	1,659,000
Cost of materials	29,797,000	33,350,000	12,201,000
Value of products	41,190,000	47,264,000	17,603,000
Value added by manufacture[2]	11,393,000	13,914,000	5,402,000

[1] Statistics for establishments with products valued at less than $5,000 are not included in the figures for 1921. There were five establishments of this class, reporting 4 wage earners and products valued at $10,000. For 1919, however, data for 5 establishments of this class, reporting 7 wage earners and products valued at $15,000, and for 1914 data for 5 such establishments, with 6 wage earners and products to the value of $11,000, are included in all items with the exception of "number of establishments."

[2] Value of products, less cost of materials.

TO STUDY PAPER SITUATION IN EUROPE

George H. Carter, Public Printer, will sail for Europe on May 12 to attend the convention of the International Conference of Master Printers to be held in Sweden in June. Mr. Carter will spend some two months in Europe, during which time he will make a study of the European paper situation and printing machinery. During Mr. Carter's absence John Green, Deputy Public Printer, will act as Public Printer.

Paper Production Reaches Peak in Japan in 1922

Shows an Increase of 11 Per Cent Over 1920, Which Was the Former Record Year in Spite of the Fact that Curtailment of Production Was Carried Out During Some Months of the Year—Expansion of Production Is Accounted for Mainly by the Fact that Twelve More Machines Were Installed During the Year by Members of the Japanese Paper Manufacturers' Association—Some Grounds for Optimism.

Written Especially for the Annual Number of the Paper Trade Journal by Our Regular Correspondent.

According to the report issued by the Japanese Paper Manufacturers' Association, the total production of paper during 1922 was 629,343,000 pounds while the aggregate sale reached 637,568,000 pounds, showing an excess of sale by 8,225,000 pounds.

Sales Exceed Previous Record by 11 Per Cent

The 1922 production exceeded that of 1920, which was the highest year in the past, by 63,417,000 pounds or an increase of 11 per cent. Sales exceeded those of 1921, the largest in the past, by 86,249,000 pounds, which shows an increase of 15 per cent. This is, indeed, surprising in view of the prevailing poor economic condition. A list showing the production of paper in the years 1922 and 1921 is given below:

(Unit—1,000 Pounds)

Months	1922	1921
January	46,487	40,387
February	46,609	40,975
March	49,644	44,213
April	52,687	44,218
May	53,975	45,315
June	52,791	44,501
July	53,735	44,631
August	54,553	46,243
September	53,325	45,559
October	54,892	45,969
November	54,340	45,658
December	56,306	46,781
Total	629,343	534,450
Average	52,445	44,537

As will be seen from the above list, monthly manufactures are nearly the same in both 1922 and in 1921, making January the smallest and December the largest. In the amount of production, there is a great difference between the two. That is to say, in 1921 40,387,000 pounds was the minimum and 46,781,000 the maximum, whereas in 1922 46,487,000 being the minimum, the five months of April, May, August, October, December, would show the higher production by month, the highest being 56,306,000 pounds in December.

Monthly Average Sales

The output in December, 1922, shows an increase of 10,000,000 pounds over that of December, 1921; thus the monthly average in 1922 is 52,445,000 pounds and in 1921 44,537,000 pounds. This increase in production was mainly due to the newly installed machines. In 1921, throughout the whole year, production was curtailed to the extent of 20 per cent on printing paper (about 2,500,000 pounds monthly) and about 3,000,000 pounds monthly on news, making a total reduction of 5,500,000 pounds monthly, whereas in the year 1922, for January and February, curtailment of production was carried out on the same basis as 1921 and, effective in March, the reduction in output was altered to 10 per cent for printing and 1,350,000 pounds for news.

In addition to this, twelve new machines were installed in paper mills belonging to the Association. This has had much to do with the increase of production in 1922. Considering receipts and disbursements of paper companies, the last year might be regarded as the year of greatest depression since the economic movement which followed the war. The market value of paper suffered a series of declines. Small paper manufacturers had difficulty in management causing some of them to close their factories down either temporarily or permanently. Heretofore, our paper manufacturing industry made such rapid progress and development that imports of foreign paper were no longer required, nevertheless, the imports in 1922 were enormous, amounting to 114,624,000 pounds, the highest figure ever recorded. These are tabulated by month as follows:

Foreign Paper Imported

(Unit—1,000 Pounds)

Months	1922	1921
January	6,591	1,211
February	6,459	2,089
March	8,313	2,152
April	7,457	2,157
May	10,997	2,271
June	10,567	2,385
July	10,880	3,910
August	13,222	3,121
September	11,507	3,084
October	8,795	3,376
November	7,362	11,040
December	11,468	8,882
Total	114,624	45,683

As will be seen in the above table, in January of 1922, imports were only 6,591,000 pounds. Making a monthly increase, they amounted to 13,222,000 pounds in the month of August. Since then they fell off somewhat, but again in December came up to 11,468,000 pounds. The aggregate of 1922 showed more than twice the imports of 1921. Such a rapid increase in imports can only be ascribed to the higher value of paper in Japan.

At the outset of 1922, there were 87,529,000 pounds of paper stored in warehouses in Japan whereas at the close of 1922 this declined to 78,623,000 pounds, a decrease of 8,906,000 pounds. This amount can be regarded the consumption in the interim, of which the amount exported to foreign countries follows:

Paper Exported from Japan

(Unit—1,000 Pounds)

Months	1922	1921
January	3,664	2,663
February	3,551	2,856
March	4,732	4,838
April	4,838	6,778
May	6,367	5,246
June	6,862	4,078
July	4,711	4,538
August	5,681	4,426
September	6,553	5,053
October	6,048	8,104
November	7,086	6,269
December	7,000	6,081
Total	67,100	60,937

As shown in the above, the export-trade of paper in the year 1922 evidenced, in the main, a better tone and gradual increase.

Comparing this with 1921, an increase of about 6,000,000 pounds is noted. In other words, exports in 1922 were the highest with the exception of those of 1918, which was the record year in the past.

Below is given the list showing the consumption of paper in Japan:

Years	Amount Consumed	Increase Over Previous Year, Per Cent
1912	318,542	22
1913	357,904	1.24
1914	358,823	.02
1915	356,840	.33*
1916	371,611	.40
1917	393,279	.58
1918	427,723	.88
1919	509,502	1.92
1920	541,721	.52
1921	562,255	.38
1922	681,901	2.12

*Represents the decreased percentage.

The total consumption in Japan during 1922 showed an increase of 120,000,000 pounds or 2.12 per cent as compared with last year (1921).

Outlook for This Year

Then what will happen this year? Beginning with January this year, capacity production of printing paper was resumed, but news print output will continue reduced by 850,000 pounds monthly. In other words, production will be about 500,000 pounds less than hitherto. This will make the increase in production per month amount to 2,000,000 pounds and the reduction of 850,000 pounds on news print will, in the near future, be lessened to 350,000 pounds. Besides, one machine newly installed in one of the Oji Paper Mills (monthly capacity 500,000 pounds) will be put in operation in March or April. In the latter part of the year, output of paper will be increased by 300,000 pounds monthly. Thus the aggregate production of this year will by far exceed that of last year. But the total supplies of paper in Japan will not be as high as last year because of the decrease in imports of foreign paper. This is the main point and well worth noticing.

From the beginning of 1922 foreign paper was always underquoted. In the months of April and May, the difference between it and the domestic price of printing paper was from 2 to 3 sen per pound. Though this difference became less from then on, up until about October, imported paper was quoted cheaper than the domestic. However, at present only Swedish-kraft wrapping paper is viewed favorably as far as the price is concerned and that which is now arriving applies largely to old contracts made the latter part of last year. This year no new contracts worth mentioning have been reported, therefore future imports will naturally be decreased. In other words, supplies of paper for this year will be smaller than those of last year.

Exports from January

As regards exports, in view of the similarity in prices here and abroad, more or less optimism is maintained. Last year there was a fair amount of exports notwithstanding the fact that our prices were higher than those abroad, therefore it will not be far amiss to expect a better export trade during this year. The chief point in question is that of increase and decrease in the domestic demand. Judging from the rate of consumption in the past, it is very unlikely that it will decrease below last year. In the recent monthly conference, it was decided to increase selling prices one sen per pound on printing and Silimi paper, and ½ sen per pound on news, which would show that the paper manufacturers are optimistic regarding the future.

Ground for Optimism

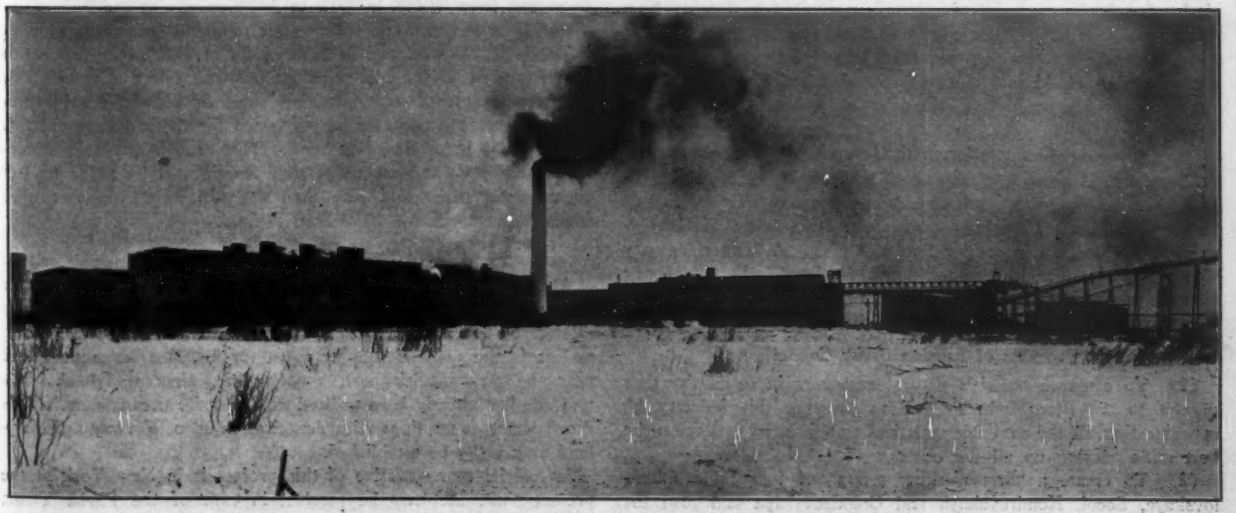
Thus there seems to be some grounds for the optimism of manufacturers and increased output will not be a matter to be considered seriously. The Swedish pulp strike will affect our market to a certain extent in view of the fact that during last year Japan was literally flooded with imports. The dispute in Sweden may, therefore, be considered one of the most influential factors in boosting the value of paper in Japan.

SIMPLEX PAPER CORP. EXPANDED

During 1922 the Simplex Paper Corporation of Palmyra, Mich., expanded its manufacturing facilities considerably. Early in the year it built a fire-proof factory addition of eight thousand square feet in which it installed asphalt compounding machines and single-faced corrugating machines. Prior to that time the company operated the paper mill only manufacturing .009 chip board.

The company is today operating the paper mill and this new department, manufacturing light weight chip board, water-proof news case lining for fine paper mills, water-proof kraft, string-insert paper, muslin lined paper, tire wrapping, and a special grade of box board which is absolutely moisture-proof and absolutely grease-resistant.

Fred P. Wood is president and Charles G. Wood secretary and treasurer of the corporation.



General View of the New News Print Mill of the Fort William Paper Co., Ltd., Fort William, Ont.

Russian Paper Industry Emerging from Chaos

Country Containing 74 Per Cent of Total Forest Area of World's Leading Pulp-Producing Countries Severely Crushed by Decade of Bolshevism—New Economic Policy Recognizes Right of Private Ownership and Safeguards Pulp and Paper Interests—Russia in Need of Technical Men and Capital—Co-operation with Soviet Government Is Closer—Extensive Development Now Planned in North Dvina

Written Especially for the Annual Number of the Paper Trade Journal

A comparison of the three countries possessing the most important forest reserves, namely, the United States, Canada and Russia, would show that the first of these three has 12 per cent of the total forest area, the second 13 per cent, while Russia boasts no less than 74 per cent. In 1920 there were 110 paper mills in Russia with 146 machines. Sixty of these mills were in actual operation, with an annual production of 40,000 tons. Thirty-five out of the forty-five pulp mills which Russia has produced some 28,000 tons of pulp in the same year. The following year, 1921, showed a decrease in production of 3 per cent.

Paper and pulp production in Russia during the past few years have been deplorable. Mills have been forced to operate spasmodically, using worn machinery and equipment, being sorely pressed for lack of capital, and handicapped by scores of other unfavorable conditions. It is safe to assert that recent production has not been higher than 30 per cent of Russia's capacity, and this has frequently ebbed to as low as 5 per cent. Thus the cost of the finished product is enormously high and the production ratio continues to be hopelessly small. These conditions became still further aggravated with the inception of the year 1922.

Effect of Political Situation

The political situation in Russia has had a great deal to do with the status of the paper and pulp industries. The last effort of the present Russian government to save the country from complete economic ruin, the so-called "New Economic Policy," permitting private enterprises to thrive of their own accord and recognizing private property rights, has, on the one hand, made for a considerable element of speculation, but on the other, it has laid a foundation for the improvement of economic conditions in Russia. Now the relationship between the government and Russian scientist, technical men and business men has been greatly improved. The latter have been called into close co-operation and under these conditions work has again been taken up on a broad and profitable scale.

Co-operation With Government

There are, at present, a number of scientific, technical and business societies, councils and committees and other organizations in Russia which are working successfully independent of Government institutions, but in co-operation with them. A "Paper Industry Congress," the official organ of which is the "Technic-Economic Council of the Paper Industry Congress," was recently organized with a view to carrying out the following program:

Program of Russian Paper Council

(1) To conserve Russia's natural resources in so far as they pertain to the paper industry and to preserve this industry by concentrating all the available technical and financial means on the best mills, closing up all the others.

(2) To create a "first working group" of four mills, Okoulovskaya, Socol, Kondrovakaya and Golodaovskaya and plan for a production of 30,000 tons per year until conditions become such that more mills may be added. In the "second potential group" a few others of the best mills were placed with the understanding that their operation was to be resumed as soon as economic conditions rendered this feasible. A production of 1,000,000 tons has been outlined for the next ten years and by 1940 it is expected that Russia's production will have amounted to 3,000,000 tons.

(3) To defend, by any means, the right of private enterprise and to uphold private organizations entering into the pulp and paper business. It is planned either to rent the existing mills to new companies or to build new ones.

Lay Foundation for Growth

Other organizations to promote the welfare of Russia's paper industry are the Ukrania Paper Trust, the Petrograd Paper Trust, North Forest, and the Gomel Paper Syndicate. These organizations are, for the most part, composed of business men, technical experts and those allied with the pulp and paper industry under the old regime. They have formed these societies in order that concerted action may be taken to extricate Russia's pulp and paper industry from the chaotic turmoil which has prevailed in recent years and to lay a substantial foundation for industrial growth and recovery. Russia's immediate needs in this direction are serious, energetic and enterprising men, capable of moulding the industry into some semblance of its former self, and sufficient capital to expand operations.

Effects of Bolshevism on Paper Industry

The extent of the renaissance which is before Russia today may best be realized when the effects of Bolshevism on the industry are observed. The average production of paper per worker decreased from 34,668 in 1913 to 3,611 pounds at the low ebb in 1920. Four hundred and twenty-four thousand tons of paper were made by 25,000 workmen in 1913, while in 1920 paper production had decreased 90 per cent with but one-fifth fewer workmen. At the present cost of manufacturing paper in Russia, nearly three tons of foreign paper may be purchased for the same amount that one ton may be produced at home. This ratio is gradually diminishing, but it is safe to assert that Russia will be a far greater consumer of paper and pulp than she will be an exporter until fundamental conditions have been righted.

Mill Tapping Large Area Planned

At present plans are on foot for an extensive pulp and paper development involving 1,000,000 square miles of spruce lands. The district to be exploited is the Basin of the North Dvina River, and it is the plan of the promoters to install a large pulp mill near the Arkhangelsk port, situated on Naimakea Island. The mill site has already been utilized as a pier for ocean liners. Thus direct water connections with America, Sweden, Norway and England may easily be established.

An official representative of this project is in New York at the present time. He may be reached in care of the PAPER TRADE JOURNAL and will be glad to answer the inquiries of any American pulp or paper men who may be interested.

Finnish Paper and Cellulose Industry Expand

Exports of Cellulose Increased Greatly During the Past Year, Amounting for the Period from January to September to 134,694 Tons as Against Only 75,479 Tons for the Entire Year in 1913—From January to September, 143,795 Tons of All Varieties of Paper Were Exported—Finland Stands Fourth Among the European Countries from Which Pulp and News Print Is Exported to the U. S. A.

By Per Nystrom, Editor "Mercator," Helsingfors

The onesidedness of its production is doubtless a great weakness in the economical situation of Finland. Excluding agriculture, which is carried on almost exclusively for the supply of the home market, the wood refining industry is the dominating factor in the economic activities of that country. This can best be seen from the fact that the products of the wood and paper industries amounted, before the war, to 75 per cent of the entire export of the country, and during last year this proportion was sometimes over 90 per cent. Under such conditions it is clear that the state of the market for Finland's trade is most intimately connected with the position of the wood and paper market. This made itself particularly felt during the war when the export of sawed wood almost came to an entire standstill, and again, five years ago, after the interruption of commercial connections with Russia, when it became a question of the paper industry endeavoring to increase the sale of its products in Western Europe and America.

Fortunately, however, the fact is that the kind of wood and wood products produced in Finland will, for a considerable time in the future, easily find a sale in the world's market. In most countries the stocks of timber have been diminished owing to the heavy consumption. Not taking Russia into consideration, where the political conditions for the present prevent all real production and export, Sweden, Norway and Finland are the only countries in Europe that to any great extent can claim to be wood producers.

Large Forest Areas Cultivated

The forest areas now under cultivation amount in Sweden to 58,500,000 acres, in Norway to 13,800,000 acres, and in Finland to about 49,400,000 acres. In proportion to its extent and situation Finland is now the most wooded country in Europe. Sawed wood, cellulose and paper are exported from it to all parts of Europe, and to Africa, South America, Australia, Japan, China and India. Even the United States, which in a short time has exhausted its valuable supplies of timber, is now compelled to import wood products from Scandinavia and Finland.

Of the forest areas now under cultivation in Finland nearly half belong to the State and the rest to private persons and companies. As the private forests have generally the best situations, their yearly growth is considerably greater than those of the State. According to the latest estimates of exports, the annual growth of the country's forests amounts to about 35.2 million cubic meters, of which about 30 million cubic meters is in the private, and 5 million cubic meters in the state forest. The consumption of wood in 1913 is estimated at 37.3 million cubic meters. The production was diminished during the war, but it is expected that the consumption in the immediate future will rise to about 38.8 million cubic meters yearly. Even though Finland's wood supply, in spite of this excess of consumption, cannot be exhausted for several hundred years, it has, however, been considered expedient to lay definite plans for rational and economical forest operations. To reduce the consumption of wood as fuel, large waterpower stations are being erected, among other places, at Imatra; experiments are being made with turf as a fuel on the state railways, and efforts are being made to increase the growth in the forests by rational cultivation.

Room for Great Improvement

Finland could obtain a considerably greater national gain from its supply of wood if the export of unprepared wood could be diminished and that of manufactured products increased. A comparison with Sweden shows that the export of wood pulp, cellulose and paper per hektar of forest area is about twice as great as in Finland. Of the entire quantity of wood destined for export, the pulp, cellulose and paper industries in Finland comprised, before the war, about 16 per cent, and last year about 25 per cent. For Sweden the corresponding figures are about 50 per cent and for Norway about 70 per cent. Thus a very great improvement has yet to be made in the Finnish wood refining industry before it can reach the same high level as that of the neighboring Scandinavian countries.

A few short historical particulars regarding the Finnish wood refining industry might perhaps be of interest. The export of wood from Finland, until about the '60s, consisted partly of handsawed planks and boards and partly of wooden goods manufactured at small water-driven sawmills. At the end of the '50s it was permitted to erect steam sawmills and this meant an extraordinary advance for the wood industry. As in the '60s and '70s, a favorable state of things obtained in foreign markets, the exports from Finland soon increased considerably in bulk. In the '90s the country exported 1.2 million cubic meters sawed wooden goods, in 1900 2.4 million, in 1910 3.1 million and in 1913 4.2 million cubic meters. During the war only 200,000 standards were sold abroad, but later these figures have again risen. In 1921 the export had already risen to 3 million (at the same time Sweden exported 2.5 and Norway 0.3 million), and from January to September, 1922, to 2.9 million cubic meters. The most advanced manufacture is represented in Finland, primarily by carpentry, reels and veneer factories. As an exporter of reels Finland occupies the first place in the world.

The First Paper Factories

Already in the first half of the nineteenth century there were about ten small paper factories in Finland; the first paper machine was purchased for the country in the year 1841 by J. C. Frenckell & Son, at Tammerfors. As pine fiber instead of rags has since the middle of last century been employed to an increasing extent as raw material in the production of paper, the future of this industry in well-wooded Finland was fully assured and it has now the greatest producing value of the industries of all countries.

In the year 1913 Finland produced 154,635 tons of wood pulp, of which 44,915 tons were exported. In 1920 exports rose to 100,000 tons but sank to a little over 50,000 in 1921. From Sweden exports were in 1920 about 160,000 tons and in 1921 only 60,000 tons, and at

the same time the exports from Norway were 200,000 to 140,000 tons, respectively. For the first nine months of 1922 the export of wood pulp from Finland has amounted to 39,608 tons.

Cellulose Exports Greatly Increased

The export of Finish cellulose was greatly increased during the last year. In 1913 it amounted to only 75,479 tons. In 1920 to 83,257 tons, in 1921 to 122,802 tons and from January to September, 1922, 134,694 tons. The exports of cellulose from Sweden were, in 1920, something over 700,000 tons, but sank to 439,000 tons in 1921. The corresponding figures for Norway are 220,000 and 90,000 tons, respectively.

The production of paper in Finland is estimated to be, in 1913, 167,631 tons, of which 145,635 tons were exported. In 1920 the export of paper amounted to 130,000 tons and in 1921 to 128,242 tons, of which 93,896 were news print. From January to September in 1922 the exports were 96,994 tons of news print and 46,801 tons of other sorts, amounting in all to 143,795 tons—a record quantity. The paper exports of Sweden were, in 1920, nearly 270,000 tons, but in 1921 only 185,000 tons. The export of paper from Norway in 1920 was 185,000 tons, and in 1921 only 80,000 tons.

These figures have been quoted to show that Finland now plays an important part in the international market for wood pulp, cellulose and paper. As an example of the Finnish paper industry's ability to compete in the transatlantic markets, it may be mentioned that Finland during the last half year stood fourth among the countries from which the United States imported wood pulp and news print. The Finnish export has, of course, been greatly helped by the low rate of exchange that has prevailed lately.

Finnish Paper Industry Busy

Despite the depression from which the whole world has suffered the Finnish paper industry has been almost constantly employed even though the low prices have made only a very narrow margin of profit possible. Now that the state of the market has again improved the factories have orders sufficient for several months. The situation of the wood industry is also very favorable. The stocks for the year are completely sold out and it is considered that a large demand may be expected in the coming season. Though prospects for the moment are bright, industry in Finland has considerable difficulties to cope with, including want of sufficient capital, heavy taxes and a fluctuating exchange.

BERMINGHAM & PROSSER CO. IN NEW HOME

The Bermingham & Prosser Company, wholesale dealer in paper and twine, has moved into its new warehouse and sales offices, 508-512 East Frank street, Kalamazoo, Mich. The building and site represent an outlay of $150,000 to $200,000.

The structure is one of the finest paper sales establishments in the Middle West and from the standpoint of construction, equipment and general arrangement leaves little to be desired. The

NEW BUILDING OF BERMINGHAM & PROSSER CO.

building is 66 by 176 feet in dimensions, three stories and basement and has between 45,000 and 50,000 square feet of floor space.

The general offices are on the second floor, and include the accounting room, stenographers and sales offices, also private offices for Louis Simon, E. E. Ludwig and W. J. Donahue. All the rest of the building is devoted to warehouse purposes.

The offices have terrazza floors and brown mahogany trim interior finish and are spacious and attractive.

The building is equipped with a two and a half ton electric elevator. The heating plant includes a Kewanee smokeless boiler, with the vacuum system of heat distribution and thermostatic control. All the shelving is of steel, all window sash also being of steel.

The building is constructed to carry a minimum load of 250 pounds to the square foot, but the floors can safely carry three or four times that weight, if the necessity required it. The floors throughout are of reinforced concrete, the same material being used for all foundations, piers and supporting pillars. The building is carried on 20 massive piers, each 12 feet square and approximately five feet thick. The front of the structure is of an attractive tapestry brick, while concrete and common brick are used for the sides.

O. F. Miller, contractor, not only erected the building, but also prepared the plans.

Bermingham & Prosser own a strip of land, 66 feet wide and extending through from Frank to North street, a distance of 352 feet. The warehouse covers just half the land owned, and ample provision has been made to double the present shipping and storage capacity, whenever that seems necessary.

This concern has enjoyed a remarkable recovery of business in the past 12 months. To the original line of writings, card board and high-grade book and coated papers, has been added a complete line of twines and coarse wrapping papers. The field is no longer limited to the printing and publishing trade, but to all branches in retail lines.

The Kalamazoo office takes care of trade throughout Michigan, Indiana and Ohio. Bermingham & Prosser also operate offices in New York and Chicago and last September opened an office and warehouse in Kansas City, Mo., to handle the southwestern business. The latter branch is known as the Bermingham, Little & Prosser Company, being under the management of Roger E. Little. Associated with Mr. Little and in charge of sales is Joe Bermingham, formerly in the local sales department and favorably known in this section.

NOW F. T. PARSONS PAPER CO.

An advertisement appears in the local newspapers by the B. F. Bond Paper Company, of Baltimore, stating that the Washington branch will hereafter be known as the F. T. Parsons Paper Company. The Bond Paper Company says in part: "We wish to announce that we have sold the assets, stocks and good-will of our Washington branch, which will in the future be known as the F. T. Parsons Paper Company. We thank you for your splendid support during the past 14 years and trust that the new company will enjoy a continuance of your patronage in even greater degree." Mr. Parsons has for many years been manager of the local branch of the Bond Paper Company.

Cheap Money Disturbs German Paper Industry

French Invasion of the Ruhr Demoralizes Exchange Value of Mark and Causes Unprecedented Increase in the Price of Paper and Other Manufactured Materials—Paper Exports from Germany Not Very Heavy in 1922 Because of Unstabilized Condition of Exchange—Future of the Industry Hinges Largely on Obtaining Adequate Supplies Which Formerly Came Very Largely from Russia.

Written Especially for the Annual Number of The Paper Trade Journal by Sigismund Ferenczi, Editor Papier Zeitung

It is impossible to describe the development of the paper business of the last year without connecting this development with the events of European politics. The economic war between France and Germany was the chief cause of these politics. France endeavored to draw out of Germany as much money and as many goods as possible, and Germany made every effort to reduce the sum of her yearly payments to a level which might allow the German people a very modest livelihood. As all countries of the civilized world are interested in the settlement of this question, conferences have been held in different places, famous bankers came together and proposed arrangements, but the end of all these conferences was a complete failure, as France always asked much more than Germany could afford to pay.

Now every one of these conferences raised in the beginning new hopes of stabilizing the Mark. There was a pause in the drop of the Mark and in the climbing of the prices of all commodities. But as soon as the conference ended without result, the Mark dropped the heavier and losing more and more its buying power, prices of all manufactures, including paper prices, became proportionately higher.

How Prices Were Affected

The consequences will be clear to everybody when comparing the values in the beginning and at the end of 1922. (The prices are given in Marks.)

	January 1922	January 1923
100 Kg=220 lbs. newsprinting paper	700	59,300
1 cubic metre—about ⅓ cord pulpwood	400	50,000
1 U. S. Dollar	190	7,500
100 Kg=220 lbs. chemical pulp 1 b, strong	660	50,240

In January the French invaded that part of Western Germany which includes the richest coal mines of Europe. Having the products and their distribution in their hands, they hope to force the German industry to pay them in the form of a coal tax more than the country is ready to give them. This invasion with mighty military power has had the effect, of causing every German, rich or poor, workman or manufacturer, to do his best to hinder the French in attaining their aims. In the first days after the invasion the dollar rose for a short time to about 48,000 Marks, and the prices of the commodities rushed after the dollar. Paper prices were raised two times in four weeks, first by 100 per cent, then by 60 per cent, and at this writing they are more than three times as high as in January. In the beginning of February, four weeks after the French invasion German currency having dropped to one-tenthousandths of its pre-war value, the Government decided to make every effort to better the Mark. They bought Marks at the foreign exchanges, and this operation resulted in a few days in doubling the value of the Mark. They are earnestly resolved to maintain this value and now invite the industry to take Government's securities against foreign bills or notes. The success of this loan will enable the Government to strengthen the Mark for rather a long period and thereby to continue the resistance against the French invasion. Thus the stabilizing of the Mark seems to be arrived at for some time, though at a very low value, *i. e.*, one dollar equal to about 20 to 25 thousand Marks. This stabilization has a very bad effect upon the export business, as the home prices of almost all goods, also of paper, have in the meantime reached or surpassed the level of the prices of the world market. The German law forbids exportation at a lower price than that which rules at the home market, for the home users have to be protected, and dumping must be avoided.

Paper Exports Decline

Paper exports in 1922 were not very heavy and declined from month to month. The main cause thereof was that the buying power of the dollar in Germany did not keep pace with its exchange value.

The following quantities of the different sorts of paper and board have been exported in the year 1922. Only the principal items, which are of interest to the U. S., are given here:

	Quantities in 100 Kg=220 lbs. Whole Export	Export to U.S.A.
Chemical pulp	733,298	195,596
Press board	63,882	4,224
Wrapping paper	712,387	61,815
Printing paper	1,482,022	297,767
Writing paper	307,539	6,114
Drawing paper	13,567	2,170
Tissue paper	53,242	2,107
Photographic paper (not sensitized)	124,559	27,716
Coated paper	171,049	7,650
Photographic paper, sensitized	14,483	.....

The German paper industry as a whole is a first-rate export industry. This is shown by the following figures:

The importation of paper, board and paper and board wares in the year 1922 amounted to about 974,000 dz. (1 dz. = 100kg. = 220 lbs.), and the exportation of the same goods in 1922 to 4,947,-700 dz.

Pulpwood Difficult to Obtain

The future of the German paper and pulp industry depends on getting enough pulpwood. Before the war Germany had to import two-thirds of her pulpwood from foreign countries, mostly from Russia. During the war the home forests were the only sources and were sufficient for the restricted demand. Later on, the industry recovering, importation became necessary, but Russia could not sell anything, first as the Soviet Government declined to have anything to do with capitalists, later on, because the whole country was and is still depleted of money, railways, locomotives and many other things necessary for trade. Many years' work will be necessary to renew the business between the German pulp makers and the Russian wood workers. The Austrian Alp countries Czechoslovakia and the new States which now border Russia (Poland, Esthonia, Lithuania, Livland) are coming to the front as sellers of pulpwood, and the prices of this commodity became higher month by month. The scarcity of pulpwood had the effect

of raising the prices in the home forests to an exceedingly high level.

The importation of pulpwood in the year 1922 amounted to 8½ millions dz. = about 2 millions of cubic metres = roughly about 130,000 cords. This quantity of pulpwood was somewhat more than half of the whole needs of the chemical pulp mills, whose actual production may be figured to about 700,000 metric tons (1 metric ton = about 2,200 lbs.). The makers of mechanical pulp mostly use pulpwood from the home forests.

The greatest part of the imported pulpwood, *i. e.*, 3¼ millions dz. = about 52,000 cords came from Czechoslovakia, and only a little less from Western Poland.

Technical Matters

In technical matters no important progress is to be noted. Building and new machinery are very expensive in consequence of the drop of the Mark, and as for many years the mills were crowded with orders, competition, the chief cause of progress, did not exist. Only the stabilization of the Mark can change this state of affairs.

The Union of German Papermakers held their convention in Nuremberg as a Golden Jubilee Convention.

The Union of the Paper and Pulp Chemists and Engineers have continued to develop the researches of paper and pulp making processes. With her more than 600 members, 250 of which are living outside of Germany, this Union is not only the oldest but also the largest in membership of all similar associations. She is in friendly relations with the American Technical Association of the Pulp and Paper Industry and with Scandinavian associations of paper technologists.

Outlook for the Future

The outlook of the German paper business mainly depends on the events in the Ruhr district. The fight of a disarmed people against the strongest army in the world is very difficult, and the people there must bear many sufferings for their patriotism. Nobody can say, how long they will be able to continue this unequal fight, though the unoccupied part of Germany gives them every possible help.

WM. MANN CO. TO MAKE STEREOTYPE PAPERS

Written Especially for the Annual Number of The Paper Trade Journal

Passage of the year brought to the Lambertville mill of the William Mann Company, Lambertville, N. J. two notable developments. There was first of all the virtual reconstruction of the old properties whose building history runs back, in part at least, almost a century.

The rebuilding involved the strengthening of old foundations and the building of new ones, the reinforcement of walls, the building of

Wm. Mann Co. Mill at Lambertville, N. J.

concrete floors, the covered connection of buildings with each other and such like, all transforming the old properties into a modern structure entirely adequate for the purpose of manufacturing the manifold papers, tissues for transformation into carbon papers and finally stereotype papers.

To Make Stereotype Papers

It was the production of this last class of paper product which spelled the second great forward step taken. After experimentation practically since the close of the War, the company was able to produce during the year an American made stereotype paper equal even in its present stage to English made products. The firm, however, is not yet satisfied with its efforts despite the fact that the paper thus far made has been distributed for testing out purposes to newspapers in all sections of the country from which have come back encouraging reports. Experimentation is to be continued, although the end is in sight and the company is confident that before the year closes, it will have produced on a commercial basis a stereotype paper which will be the equal of the best now used for the purpose in this country.

The mill is under the direction of superintendent A. Rhan, while William M. Prizer, son of the president of the William Mann Company, Harry A. Prizer, is general superintendent of the mill.

Celebrating Seventy-fifth Anniversary

The William Mann Company is this year celebrating the 75th anniversary of its establishment by William Mann, then thirty-four years of age, in half of his residence at 74 North Fourth street, Philadelphia. It was truly a one-man concern, for William Mann was not only a manager, but handled the shipping, was credit manager and filled all other positions real or fancy. After a few years, however, business outgrew the old quarters and there was rented the second floor of 25 So. Sixth street, with an increase in shipping facilities by the purchase of a horse and wagon. It was in this building that there was invented Mann's Parchment Copying Paper which has become famous throughout the world. Further increase necessitated several removals until finally there was purchased and occupied the entire building at 529 Market street, the present home.

FINE BENTONITE IN ALBERTA

The largest deposit of bentonite in the world has been discovered near Rosedale, Alta., by Prof. N. C. Pitcher, of the University of Alberta. The deposit, according to Professor Pitcher, contains millions of tons of pure bentonite and has tremendous possibilities for commercial exploitations.

Bentonite is a species of talc, commonly called soapstone. It is a hard, rock-like substance and expands when exposed to water. Its principal use is in paper making. It is added as a filler to the pulp to produce a white, opaque finish to the paper.

Practically the whole Canadian production of bentonite has come previously from Hastings county, Ont., where a mill for grinding and finishing the mineral is located. A small amount has come from a deposit near Vancouver, B. C. The annual output of bentonite in Canada is about 20,000 tons. Discovery of the new beds in Alberta by Professor Pitcher will, it is believed, be a big factor in increasing the production and developing the commercial uses of bentonite.

New Homes for Philadelphia Paper Firms

Past Year Has Been an Unusually Active One in the Acquisition of New and Larger Quarters by Quaker City Paper Merchants—New Structures Include Half-Million Dollar Warehouse for the Paper Manufacturers Co. and the American Bag & Paper Co. and Improvements by Chas. Goldman, Central Paper Bag Mfg. Co., Wilder Bros., Franklin Paper Co. and Others—Center of the Paper Trade.

Written Especially for the Annual Number of The Paper Trade Journal by Gene Carr

Philadelphia, nationally known as the City of Homes, can, as a result of the wonderful strides in construction by paper houses made during the last twelve months, lay claim with equal basis of facts to being pre-eminently the City of the Paper Houses. In no other city, perhaps in all the United States, has any twelfth month developed such activity, seen so large an expenditure actually made or committed to in the purchase or erection of business homes as was experienced in the Quaker City.

The direct interest which the patrons of these establishments have in these remarkable developments, lies in the fact that all of them assure improvement in service. Underlying the expansion plans of all are the provisions for increased and more efficient receipt and delivery operations, worked out by larger provision for receiving platform or by location on railroad mainlines, sidings or spurs, or in close adjacency to wharves and all of them telling the story of a desire more expeditiously and more economically to take in goods from the mills and to send them out to their customers.

Latest and Most Approved Ideas Embodied

But embodied in the plans of all the new structures and in those old ones where extensive renovations made it possible, are the latest and most approved ideas not only for the storage of paper stock under the best conditions of subdued light or of darkness and of as constant a temperature as is possible, and as well the comfort convenience and pleasant surroundings of employees. Time was when anything in the way of a structure capable of sustaining a load was regarded as adequate for a paper house, but the new idea as expressed in the physical developments of recent days is to design the structure always keeping in view the purpose for which it is intended. And so floors are not only built tremendously strong but all the other appointments specifically are designed for paper storage, paper cutting and paper handling.

The new structures all show a return to the old idea of having warehouse and stockroom and administrative offices just as closely contiguous as is possible or, better, of having all under one roof. That was really the pioneer system in the paper business. Then there came a departure of regarding a centrally located office as essential, but a warehouse location anywhere within short hauling distance as adequate. The apparent fallacy of this proposition was made evident in several notable instances with the result that the new idea was modified and there was a return to the old-fashioned custom.

Center of the Paper Trade

But while the year brought forth this tremendous and unprecedented physical expansion in structure and while as a consequence the Philadelphia paper world also expanded geographically, what might be called the center of magnetism shifted but little. Time was in recent memory that if a compass point was set down say at 6th and Market streets, and the other point extended but a quarter or a third of a mile there would have been included within its sweep virtually all the prominent factors in the Philadelphia paper distributing business. Today despite the removals to new locations, 6th and Market streets still remains the center of the paper trade circle.

Paper Manufacturers' Company New Warehouse

Most conspicuous of the entirely new paper warehouses, representing the largest outlay of capital, the greatest area of structure, and provision for future requirements, is that of the Paper Manufacturers' Company, which is erecting a building to cost approximately, with equipment, $500,000, and which will cover almost the entire area of the Philadelphia city block bounded by Fifth, Randolph, Willow and Callowhill streets. By mid-March such progress had been made that the tremendous foundations were all done and the concrete was being poured for the first story of this new six-story structure.

New Building to Be Six Stories in Height

To make way for the new building a score of small structures, some of them dating back to Colonial days, were razed. The new building will be six stories in height, over a very large basement area, and will have an aggregate space of almost one hundred and fifty thousand square feet. It will have a frontage on Fifth street, which in recent years has become the principal artery of north and south traffic, East of Broad street, and which probably is destined to become the most important feeder to the Delaware River bridge now under construction, running for one hundred and twenty-six feet from Willow street, whereon are the tracks of the Reading Railway, towards Callowhill street, the broadest thoroughfare north of Market street in the city center. It will extend along Willow street one hundred and eighty feet deep to Randolph street. From Willow street there will run into the new warehouse a siding accommodating three freight cars and on these, by means of the Reading Railway tracks which connect with the Belt Line operated co-jointly by all the railroads entering into Philadelphia, cars can be directly received from or despatched to any point in the United States. On the Callowhill street front the firm is erecting a garage for its fleet of trucks. There will be two five-ton elevators which with connecting Shepherd lift and traveling hoist penetrate into every part of the new structure. There will be facilities for the simultaneous unloading of three freight cars under cover and the transfer with a minimum of cost and time to any portion of any of the floors. These are designed to sustain a load of two hundred and fifty pounds per square foot. While three of the sides of the building will be pierced by many windows, the Randolph street front will be blank, the better to stock in darkness and in uniform temperature, the supply of paper on storage. The firm will maintain its offices on the Fifth street side, the remainder of the first floor being used for shipping and delivery. The second and third

floors will be utilized for the converting of paper into small roll products, for adding machines, ticker tape, cable recording tape and the like and the floors above for stock. In addition to the general line of coarse papers and die-wiping papers now carried the firm in the larger facilities of its new home will carry a complete line of fine printing papers.

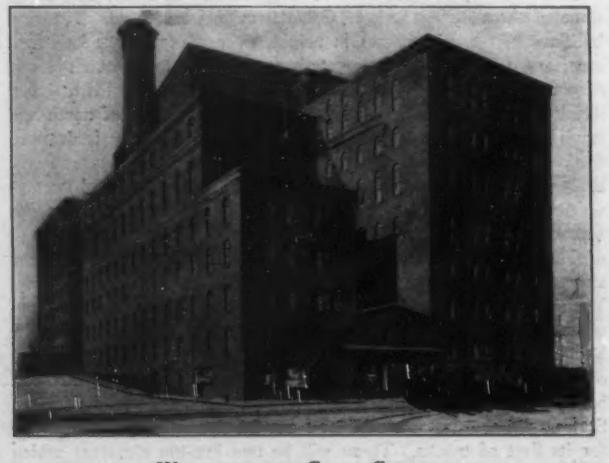
Started Eighteen Years Ago by Frank A. O'Neill

The new half-million-dollar structure is the monument of an organization begun in a small way but eighteen years ago by Frank A. O'Neill, now president of the company, and his associate on part of the first floor of 523 Ludlow street. Successive homes were at Fifth and Commerce streets and for the last ten years at 526-528 Cherry street, whose eight floors aggregated in area but two in the new home. Assisting President O'Neill in the management are his brother, J. A. O'Neill, vice-president; N. M. Glynn, treasurer, and F. W. Coar, secretary.

Chas. Goldman Buys Three-Quarter Million Dollar Warehouse

From a purely financial point of view alone the recent purchase by Charles Goldman, who all his lifetime has been identified either with the paper stock, wall paper, printing, coarse paper and paper pulp business, stands in the forefront of Philadelphia developments, for there was involved in his purchase of the massive building located at Delaware avenue, Kenilworth, Penn, Swanson and Bainbridge streets, just a little less than three-quarters of a million of dollars, but there are other facts which make this expansion one of interest.

The massive pile just purchased, lately was known as the Franklin Warehouse and Mr. Goldman will continue that designation. A large portion of its 300,000 square feet will be used by him for the storage of imported pulp and of paper stock and as well of coarse paper, but for the present some of the space will be leased. There is in his mind the development at this point of a Philadelphia Bush Terminal.



WAREHOUSE OF CHAS. GOLDMAN

The trade which intimately and favorably knows Mr. Goldman has many stories to tell of a penniless Russian boy who came to this country a third of a century ago, hawked about junk and old papers, working day and night and with the assistance of all the members of his family and then branched out into the paper stock business, the printing of wall papers, investments in real estate and thus attained the rank of a millionaire or near a millionaire. Mr. Goldman himself declares that he never worked day and night in all his life and does not propose to, and that his fortune was piled up on the basis of a small amount of hard work and a very large amount of pure good luck. It is true that he came to this country at the age of sixteen from his native town of Kiev in Russia, penniless and with but few friends. He landed in New York and after two months came to Philadelphia, working at odd jobs for two years, until with $300 saved he had enough capital to start in the peddling of paper bags from a wagon. Then he opened a coarse paper and bag

NEW BUILDING OF PAPER MANUFACTURERS' CO.

plant at 12 Bank street, where he also engaged in the paper stock business. A little later he purchased a wall paper printing machine from a plant which was being dismantled at that time and setting it up at the Bank street address, engaged in a partnership with Phillip Isaacs, trading as the Enterprise Wall Paper Company, and personally distributing the products by wagon in retail lots. The Enterprise company is still in existence and is being conducted by Mr. Goldman's former partner at Water and Morris streets. About 18 years ago Mr. Goldman entered the real estate business at 206 South Sixth street, later removing to the building now occupied by Samuel Kardon at Second and Vine streets, and where he conducted a combined real estate, paper jobbing and stock business. Every venture in the field of realty proved successful and capital investment ofttimes was doubled and trebled.

To Develop Pulp Business

Just two years ago Mr. Goldman purchased a large office building at 725-727 Walnut street, removing there from his former real estate office at 731 Walnut street, and where he is now quartered and from which the pulp business in which he has been engaged for the last ten years, but which is just about to take the largest sort of development, is conducted. In carrying out this project Mr. Goldman turned over his paper stock and coarse paper business at 333 North American street to the recently incorporated Goldman Paper Stock Company, which is controlled by his brother, Harry Goldman, and his son, George Goldman. The new incorporation also purchased a couple of months ago the four-story building at 414-416 South Front street. With the new building the stock business and the coarse paper business will be seggregated, the stock business being conducted from 333 North Delaware avenue and the coarse paper jobbing business from the newly purchased South Front street home. The building for the jobbing business has been remodeled and modernized in every detail, electrical elevators having been installed with other labor-saving devices. A sheeting and slitting department has been organized as a new development.

Mr. Goldman himself henceforth will give exclusive attention, in conjunction with his son, Louis Goldman, who recently made

an extensive trip to the pulp centers of Europe, arranging for representation, to the importation and dealing in pulp of various kinds. And it is for this purpose that the great warehouse, the purchase price of which was $700,000, will be utilized. Sharing his attention will, of course, be his Philadelphia home, with his family of four boys and four girls, two of whom are attending the University of Pennsylvania and Cornell University; his attractive summer home at Ventor, N. J., and his mid-winter sojourn in Palm Beach and other cities in the Land of Flowers.

American Bag & Paper Co.'s New Home

On a parity, financially and in trade importance, with the new home of the Paper Manufacturers' Company is that of the American Bag and Paper Company, work on which has begun and which will cover the city block from South to Bainbridge streets and from Water to Swanson streets. The plans call for the erection of an eight-story brick and concrete structure, each floor having an area of 25,000 square feet. Because of the topography of the ground, which slopes sharply from the western to the eastern front toward the Delaware River, unique architectural features were possible and the structure is so designed that while its basement floor is on the street level at Water street, the level of Swanson street is that of the first story of the new structure. The new building is almost immediately adjacent to the Belt Line Railroad tracks and to the Delaware River wharves and thus enjoys exceptional opportunity for either rail or water shipments. The frontage will be 100 feet, the depth extending 280 feet. While there are eight floors under construction, the firm is not confident of occupying the entire building facilities. However, it is proposed to triple the present operating capacity at the present headquarters at Second and Vine streets. The Vine street property will be maintained in addition to the new home. It will principally be devoted to the warehousing and manufacturing end. The American Bag and Paper Company, of which Samuel Kardon is president, and J. M. Zimmerman, his son-in-law, vice-president, is engaged in the manufacture of flat and square bags and sacks. It also jobs wrappings, krafts, news, manila, silk fibers and drug papers. It was established 20 years ago by the present head of the firm, Samuel Kardon, whose pioneer home was located just around the corner at 205-207 Vine street, now used as a warehouse by the firm. The present home was purchased from James Dyson, two and one-half years ago. When the new home is ready for occupancy it is proposed to add several new lines to both the manufacturing and jobbing departments.

Another Kardon Venture

Another Kardon venture which developed the latter part of the year was the purchase of a new home by the Central Paper Bag Manufacturing Company and which it now occupies at 1732-1738 North Blair street. The Central Paper Bag Manufacturing Company is owned by Harris Kardon, a brother of Samuel Kardon, and his son, Jacob Kardon. Another brother, Morris Kardon, is also engaged in the paper and folding box manufacturing business, 220-222-224 Pine street, this home having been purchased two years ago and remodeled into a modern establishment. Three buildings were demolished for the erection of the new Central company's bag plant, each of the buildings having four stories. In addition to the large equipment which the firm carried in the old home at 831 Ellsworth street, there were installed considerable new devices providing for an increase in the capacity of manufacture. In the present quarters adequate facilities for transportation which necessitated the removal from the old home were provided in the siding from the Pennsylvania Railroad which adjoins the property. Several carloads of bags are being shipped from the plant weekly. The brands for which the firm has developed one of the largest orders in Eastern Pennsylvania is known as the Adelphia, in both flats and squares.

Enterprise Paper Co.'s Improvements

Further expansion in the Quaker City bag industry is that of the proposed enlargement of the building facilities of the Enterprise Paper Company, Third and Callowhill streets, which through its newly incorporated body will provide for increased capital from $75,000 to $125,000. In the capital readjustment provision is made for an additional warehousing accommodation of 60,000 square feet, through the purchase of a building adjoining a railroad siding, negotiations now being under way. A charter was granted on April 1 and under the new organization the following officers were elected: President and treasurer, Nathan D. Isen; secretary, A. K. Kehr, who also are members of the board of directors. David Back also was elected a member of the directing body. With the increased capitalization it is the purpose of the firm to make the present organization a permanent body and to expand not only the buildings but also the stock to be carried in the warehouses, and to include principally paper bags, wrapping papers, paper tissue specialties, wax specialties and a large line of fibers. Within the past few years the firm's business has so increased that the large number of cars standing on the sidings awaiting reshipment has made increased warehousing space absolutely imperative. A weekly handling of a quarter of a million pounds of paper is customary. Bag sales aggregate more than 200 carloads annually, the firm being selling agents for the Consolidated Bag Company, the Grand Lake Company, E-Z Opener Bag Company's products, the O. W. D. Company's specialties, and several other mills. The present corporation is a development in the course of a decade and a half from the one-man firm which Mr. Isen established in the northern section of the city, administrative duties being divided between Mr. Isen, who acts as general manager, and Mr. Kehr, wholesale sales manager, and Mr. Back, who is in charge of the City Division of sales, in the organization of which there are eleven men, covering Philadelphia proper. A Bethlehem branch is maintained under the title of the Reliance Paper Company, with E. Mitzler in charge and a sales organization of five men covers Lehigh, Northampton and Bucks Counties and contiguous section of New Jersey. Mr. Kehr's

BUILDING OF WILDER BROS.

wholesale district covers Eastern and Northern Pennsylvania, Delaware, Maryland, New Jersey and other coast points.

Wilder Bros. Buy Six-Story Building

Purchase was made during the year by Wilder Brothers of the six-story structure having frontages of 125 feet on 12th street, 118 feet on Brown street, and 143 feet on Olive street, involving the expenditure of $150,000.

For the present the firm is only occupying 20,000 square feet of

floor space for its warehousing and executive offices on the first floor. It is enjoying, however, the splendid shipping facilities made possible by the construction of broad platforms on the three street frontages. Upon removing to the new location from its former home at 148 North 5th street, where business was conducted for five years, the firm largely developed its coarse paper and paper specialty line. Installation of a fine paper department is in contemplation. The business of Wilder Brothers dates back ten years to its establishment at 30 Strawberry street, the firm eventually moving to 143 North 4th street, where for two years it conducted a business and then removing to its last leased home on North 5th street. The founders of the firm are the present brothers, Charles A. Wilder and I. J. Wilder. Previous to entering the partnership with his brother, Charles A. Wilder was for three years secretary of the Franklin Paper Company. Both members of the firm were formerly associated with the Paper Manufacturer Company in the coarse paper department.

OFFICES AND WAREHOUSE OF FRANKLIN PAPER CO., INC.

Franklin Paper Co. Buys Building

When the Franklin Paper Company removed from leased premises at 718 Cherry street, it took offices in the Vandam Building, 10th and Market streets, meanwhile looking around for a site for the erection of a structure particularly adapted to its requirements. It thought it found such a site on a lot at 923 Locust street, but after purchase a much more desirable opportunity presented itself through the offering for sale of the five-story premises at 810 Sansom street just across the street from the big Ben Franklin Hotel, construction on which is beginning, and close to the Lindsay Brothers' Paper Warehouse. The structure was purchased, completely renovated, and re-arranged for the firm's special requirements. The main offices are located on the second floor and in a modernized setting of oak partitions, attractively decorated walls and modern electrical lighting systems. They are furnished to conform with the attractive building surroundings. The first floor is devoted to the shipping and receiving departments, while the third, fourth and fifth as well as basement are devoted to warehousing.

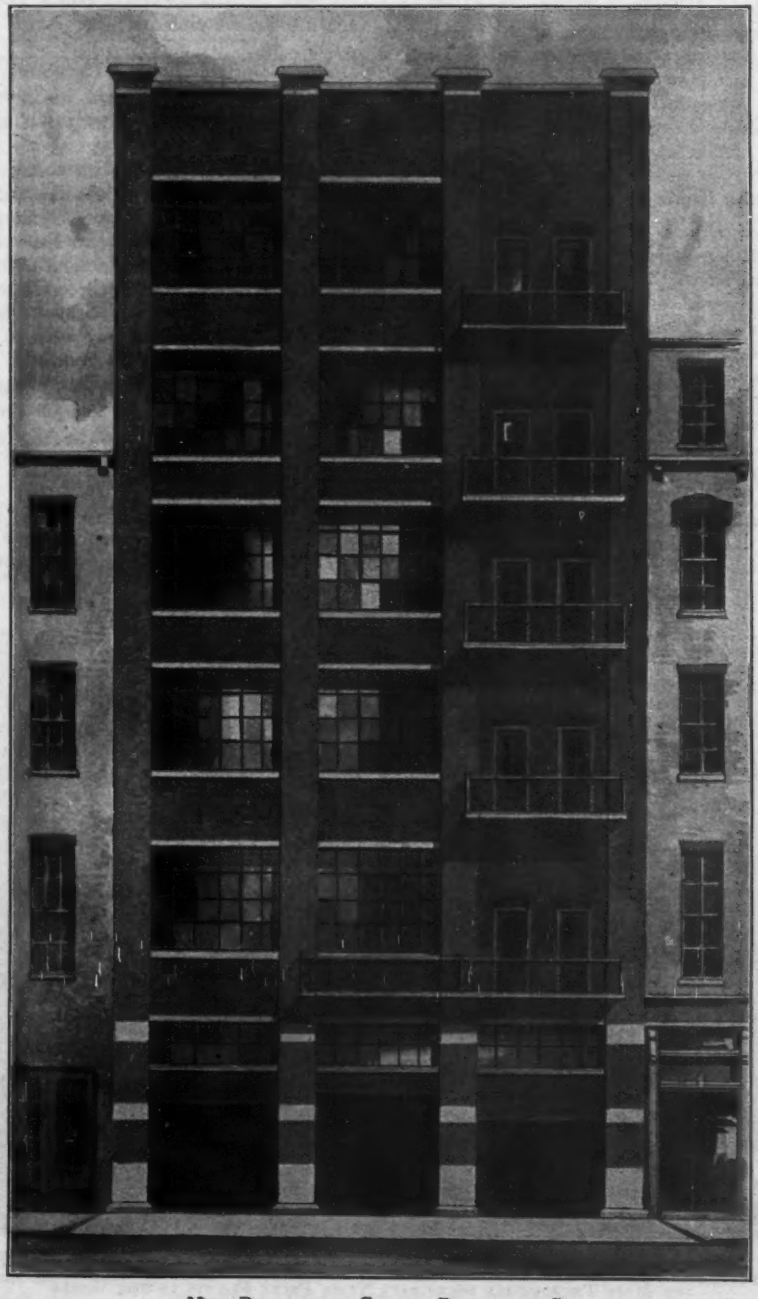
A Paper Specialist

The firm is essentially a paper specialist—it claims to handle paper products available as substitutes for leather and even of imitation leather—and indeed for every possibility of paper use, many of which are little known in the industry. The guiding mind in this particular innovation in the paper field is H. R. Hillegas, a member of the firm, who, however, had a long training of preparation through services with the old and well-known firm of A. G. Elliot & Co. At that time Mr. Hillegas periodically was assigned to visit paper mills featuring specialty operations, and he thus became possessed of an intimate knowledge, not only of their productions, but of their possibilities, so that he had at his finger ends the answer to every question of requirement which could be propounded, knew indeed whether a customer required a certain paper specialty which did not exist, and just what mill he could turn to to produce it. Paper specialties have been not only his business for a lifetime but his hobby. In his office today there is gathered together a collection of more than 3,000 paper specialties, specimens representing both American and foreign production and embracing some that practically are unknown to the large majority of paper distributors. He has gathered them together from most distant points as well as from all the American manufacturers and these give him inspiration, not only in developing new fields for the utilization of existing specialties, but of thinking out entirely new specialties and new fields for their usefulness as well. Thus to illustrate he has now perfected, but has not yet marketed, a line of papers adapted for use as substitutes for felt with possibility of their employment on toy and perhaps even regulation pool table. He has paper leather substitutes hardly distinguishable by eye or finger from the animal skin and yet possessing qualities which the hide do not, as those of water-proofness and a tensile strength running as high as one hundred and fifty pounds per square foot. Another novelty developed in the past year is the manufacture of a paper substitute for patented enamel leathers possessing all the softness and brilliance and high polish of the natural article with the advantages of a price less than half that of leather and other qualifications of popularity. There are being produced also paper pulp cop tubes used by silk manufacturers as a substitute for wooden cops hitherto generally employed. The claim is made for the paper substitute that it will not shrink nor splinter and thus safeguard the silken skein in many ways destroyed by the former wooden article. And then there are papers which take the place of the fabric foundations often employed as the basis of substitutes for leather and imitation leather; specialties for the use of suitcase and trunk manufacturers, book covers, photo-mounts and frames, indeed a bewildering variety of possibilities, suggesting that paper specialties are limitless in their application to the mechanical and industrial and the art spheres. The firm's specialties are marketed under the Frankote Brand and have an exporting market in England, Mexico and Cuba, where representatives are located. A special representation is also to be had in New York City, Minneapolis and San Francisco for the purpose of taking care of the needs of these territories. The firm's membership consists of H. A. Jacobs and H. R. Hillegas, both actively engaged in the management of the business. It was incorporated in 1910 under the laws of New Jersey and for several years the firm conducted its own

special laboratory in its large warehouse at 6th and Branch streets, Camden, N. J. The laboratories were developed as a result of the war scarcity of leather products, the Franklin Company devoting its research facilities to the development of these substitutes which now have become the standard Frankote lines.

S. Walter, Inc., Buys Building

A large structure with three fronts on Fifth street, the rapidly developing north and south traffic artery, was acquired during the year by S. Walter, Inc., but on two different occasions. The business of this firm is among the most prominent in the city, because its head is so widely known in civic circles and is a member of the Council of Philadelphia. Through consistent growth the capacities of separate buildings on Cherry street, one near Fourth, the other near Third and of other warehouse space were outgrown and thereupon the company purchased a large building at 144-146 North Fifth street, previously used as a cigar manufactory and giving triple the area formerly available. However, even this increase was not adequate and subsequently the firm purchased and shortly will enter into the possession of the adjoining property at 142 North Fifth street, which it proposes extensively to reconstruct and renovate so as to make it uniform with the main building. The three properties when consolidated will constitute one of the largest of the centrally located coarse paper establishments in the city. Splendid shipping facilities are enjoyed through the Fifth street frontage and a thoroughfare, small but adequate, in the rear. The purchase involves an investment of considerably over $150,000. The business was established as an individual firm by Simon Walter, who has been prominent not only in the government body of the Quaker City but who is also active in civic and welfare organizations. In 1918 it was incorporated under Pennsylvania law with the appointment of the present officers, President Simon Walter, Vice-president Thos. F. Kennedy, Treasurer and Manager Harry Lefkowith and Secretary L. Wilson. With the recently acquired adjoining property at 142 North Fifth street the plans for expansion of stocks carried and mill representations were made.



NEW BUILDING OF GARRETT-BUCHANAN CO.

Garrett-Buchanan Co. Building Addition

As the convention meets, there is building into shape, despite the destructive fire March 25, which destroyed 6 of the 10 buildings owned by the firm and located to the south of it, the new addition to the Garrett-Buchanan Company structures—a unique building, in that the upper floors will be completed before the lower ones are begun. The addition is on the site of two old structures at 3 and 5 Market street, with a frontage of 41 feet and a depth of 65 feet, and was originally the home of the Garrett-Buchanan Company at the time Vice-president Morgan H. Thomas began his connection with it 25 years ago. On the site there is being reared a seven-story-building with basement, involving an expenditure for the steel and reinforced concrete construction of approximately $60,000. The foundations for the great iron supporting colums first were placed in the basement of the two small buildings now on the site and the columns then reared through them. Cross girders will then be swung into place and the walls built on them. Thereafter the buildings below will be razed and the new structure be completed. On the first floor there is to be an enclosed shipping room and loading platform which at nighttime will be used as a garage for the company's fleet of seven autos. There is already in existence a five-ton elevator in the rear of the Garret-Buchanan building on which the new structure abuts, built in anticipation of the present extension, and this will be utilized

to carry stocks to and from the several floors of the new as well as of the old building. The company hopes to occupy the addition by early fall.

Whitaker Paper Co. Leases Building

Properly to be added to the list of entirely new structures or of purchased buildings, in this story of the physical development of the Philadelphia paper trade during the year are the firms which during the 12 months provided by lease of larger structures for the new or the increased business which the future holds in prospect for them.

The first of the list in point of time was the acquisition by the Whitaker Paper Company, which long had been in the Philadelphia market, but which operated only through offices in the Crozier Building, of a warehouse of its own by lease of the property at 26 North Fifth street, a four-story and basement building with a capacity of 9,000 square feet. The Philadelphia offices and warehouse is a branch of the Baltimore Division of the Whitaker company and is in charge of Halsey E. Ramsen, who for 11 years was connected with the firm, first as assistant manager in the Indianapolis office.

Other Improvements

H. J. Hogg, who for several years has been in the partnership of Shuttleworth, Hogg & Mather, recently removed to the northwest corner of Front and Arch streets, has leased the building at 127 Arch street, where he proposes to remodel and modernize the five-story structure into a bag manufacturing plant. Building operations will be completed in June, when the plant will be started on its business history as the H. J. Hogg Company. This is Mr. Hogg's second venture in his own business, having formerly conducted a coarse paper and bag plant first at 105 North Second street and later at 133 Arch street for five years. At the present time he is conducting a mill representation business in the Stephenson Building at 165-167 North Front street and carrying a stock of bags at 134 Race street.

Early this year Edgar H. Farr and Charles Swanson, formerly connected with the Philadelphia office of the Gatti-McQuade Company, 610 North American street, secured a charter for E. H. Farr & Co. and leased two buildings, one at 2008 E. Arizona street for offices and warehouse and another at 2007 E. Arizona street for additional warehousing purposes, and both for the conduct of a paper stock and waste business.

Last in point of time is the acquisition by the Universal Waste Paper Company of a warehouse at 16th and Cater streets, to take the place of its former home at 25th and Callowhill streets, taken over by the city for park purposes.

ROLLSTONE PAPER CO. FORMED

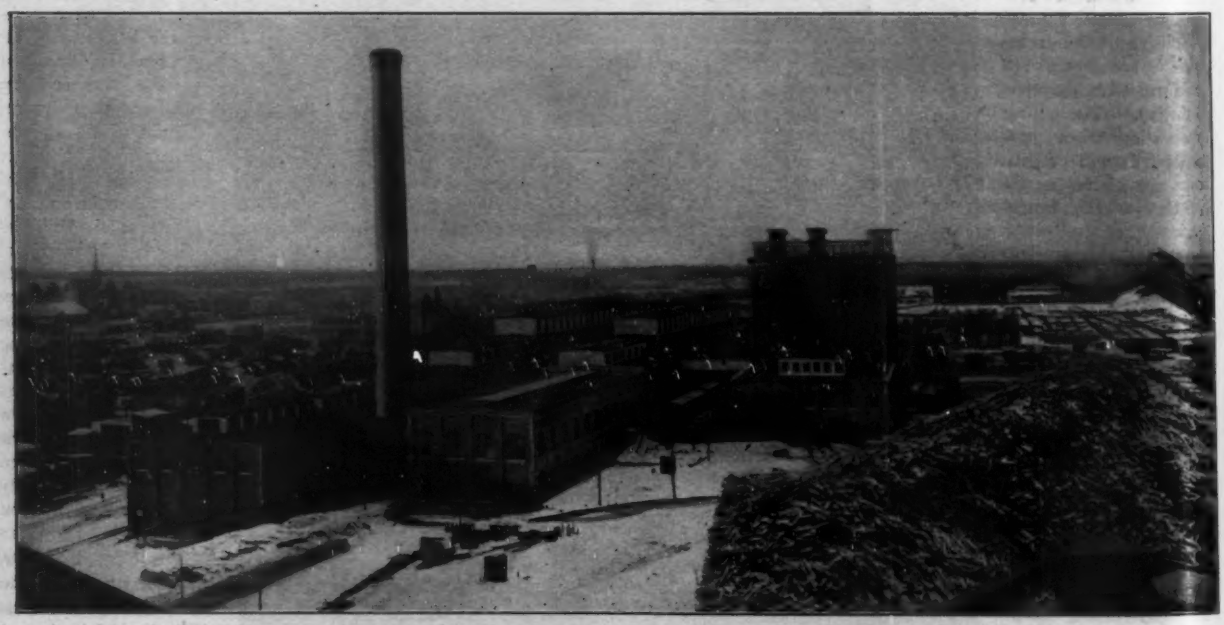
The Rollstone Paper Company has incorporated under the laws of the State of Massachusetts; capital stock $100,000 first preferred, $200,000 second preferred; 500 shares of no par value common stock.

The officers are: Louis T. Stevenson, of Pittsfield, Mass., president; Henry M. Wheelwright, of Boston, Mass., treasurer. The above, with George W. Wheelwright, Jr., compose the board of directors.

The proposition combines the forces of the George W. Wheelwright Paper Company, of Boston, and the interests back of the Mountain Mill Paper Company, of Lee, Mass. The Rollstone mill of the George W. Wheelwright Paper Company has been deeded to the Rollstone Paper Company, who plan to manufacture glassine and greaseproof parchment papers in the mill. The sales of this company will be handled by Louis T. Stevenson, of 110 East 42nd street, New York City, who is president also of the Mountain Mill Paper Company.

This arrangement combines the well-known paper making ability of the Wheelwright Paper Company with the specialized knowledge of the manufacture of glassine and greaseproof papers of the Mountain Mill Paper Company.

The Rollstone mill is being rapidly gotten into shape for the manufacture of greaseproof parchment papers. The company expects to be operating the mill in about three weeks and approximately the first of August will commence the manufacture of glassine papers.



VIEW OF THE MILL OF THE ST. MAURICE LUMBER CO., SUBSIDIARY OF THE INTERNATIONAL PAPER CO., THREE RIVERS, QUE., ONE OF THE MOST THOROUGHLY UP TO DATE NEWS PRINT PLANTS IN THE WORLD

MacSimBar Paper Co. Builds Unusual Power Plant

Is a Model of Perfection from the Standpoint of Construction, Equipment and General Design and Is One of the Finest of Its Type in the Middle West—Increases Production from 150 to 170 Tons Daily, and Insures Ample Steam for Every Requirement—Will Save Cost of Its Installation in Three Years' Time—Company Also Builds Fine New Pumping Station to Supplement Its New Power Plant.

Written Especially for the Annual Number of the Paper Trade Journal by Howard P. Hall

A saving in operating expenses of over $100,000 annually, an increase in the daily production from 150 tons to 170 tons and the assurance that the big mill can be run at its fullest capacity with the certainty of ample steam for every requirement, are three major advantages gained for the MacSimBar Paper Company. Otsego, Mich., through the erection of its new power plant.

The unit, started in February and finished in October, is one of the finest of its type in the Middle West. From the standpoint of construction and equipment and layout it leaves nothing to be asked. In addition to its structural and mechanical advantages, it is a good looking building, and the one regret expressed on seeing it is that it is not located in a more commanding position, where it can be seen by the passer-by and its superior utilitarian qualities appreciated to the fullest extent.

To secure the greatest efficiency and advantages possible the structure is located close to the mill proper. Hemmed in on the east by the administration building and on the west and north by two wings of the mill, the true proportions of the structure are not appreciated until one enters and views its great vaulted ceiling and expanse of floor space.

Plans Prepared by Billingham & Cobb

Plans for this structure were prepared by Billingham & Cobb, Kalamazoo, mill architects and engineers. They provide for a building 136 feet long, 66 feet wide and 72 feet high. Of the height, 12 feet is taken by the basement, the balance, 60 feet, by the main floor, which carries the boilers.

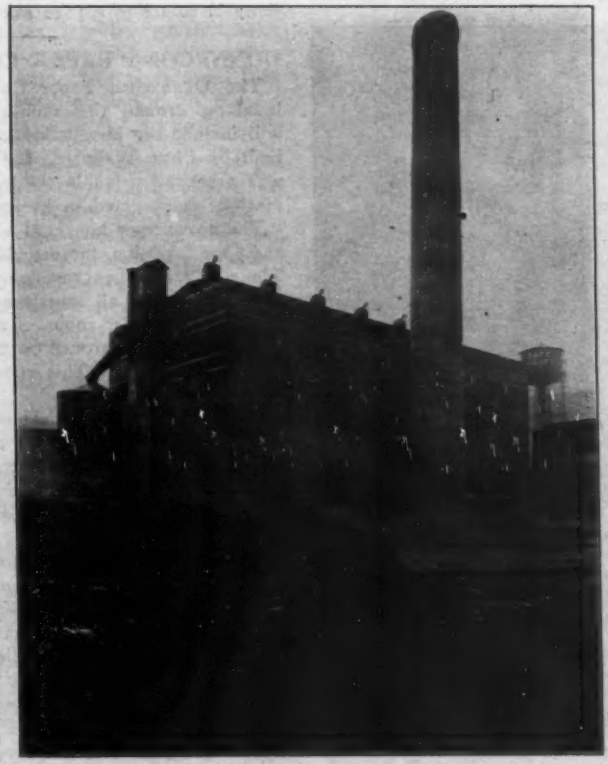
Built on low ground, it was necessary to insure a never failing foundation. The piers, footings and entire basement structure are of heavy concrete throughout. The superstructure is of a superior grade of varicolored brick, all trusses and supports being of steel and the exterior trimmings of Bedford stone. A huge monitor runs the entire length of the roof, insuring perfect light and ventilation over the boilers and in the uppermost parts of the power room. To make it further proof against fire there is a fireproof roof decking of cement tile, furnished by the Trus-Con Company, all being capped by a 20-year Barrett bonded roof. Well formed suction ventilators, Swartout type, relieve the severity of the roof lines. The windows are all set in circular head steel sash, very large, but well proportioned.

An elaborate system of steel runways, all guarded by heavy hand railways lead to all parts of the plant, adding a touch of hospitality and safety to employees and casual visitors as well. These were built by the Kerlow Steel Floor Company, New York.

General Contract Handled by H. L. Vanderhorst

The general contract for construction was handled by H. L. Vanderhorst, of Kalamazoo and Grand Rapids. The chimney, of concrete and 12 feet in diameter at the base and 150 feet tall, was erected by the Weber Chimney Company.

The equipment consists of a main battery of six 500-horse power, vertical water tube boilers, product of the Wickes Boiler Works, Saginaw. A unique feature of the installation is the fact that each boiler, together with its auxiliary, constitutes a complete power plant, entirely independent of each other unit and operated individually.



NEW POWER HOUSE OF MACSIMBAR PAPER CO.

Each boiler unit is equipped with a Combustion Engineering Company's type "E" stoker, Foster superheater and Foster vertical economizer. The superheaters will each supply 100 degrees of super heat to the steam, while the economizers will raise the temperature of the feed water to 100 degrees.

Six forced draft fans and six induced draft fans, one of each for each boiler and the product of the Clarage Fan Company, Kalamazoo, are direct connected to individual vertical engines, furnished by the Engberg Engine Company, St. Joseph, Mich.

Process of Feeding the Coal

Coal is supplied to the stokers from a steel bunker, 500 tons capacity, made by the Stearns Conveyor Company, Cleveland. In the process of feeding the coal passes through an automatic Richardson Scales Company's weigh scale, one in front of each

stoker. The bunker supply is through equipment manufactured by the Stephens-Adamson Company, Aurora, Ill., and consisting of a crusher and a run about bucket system, each bucket carrying 80 pounds of coal per load.

Accumulated ashes are dumped from the pits through Beaumont Manufacturing Company's ash gates into a steel car, passing over an ash scale and into an ash skit, by which they are hoisted and dropped by gravity into an elevated tank, so located that the contents can be dumped into trucks and hauled away. The skip hoist is the product of the Stephens-Adamson Company, while the tank, of hollow, glazed vitreous tile, was made by the Kalamazoo Tank & Silo Company, Kalamazoo.

The steam generated in each boiler is metered through a Republic flow meter, Bailey product, while two G. E. main meters keep a correct record of all steam used, one in the process of manufacturing paper, the other in making steam. Each boiler is also equipped with triple draft gauges, registering the air pressure under the fire, the air pressure over the fire and in the last pass of the boiler. All accumulations of soot in and about the boiler flues are removed by soot blowers.

The piping throughout the power house was done by Wheeler & Blaney Company, Kalamazoo, while S. B. Conklin, Detroit, furnished the pipe covering.

Should Pay for Itself in Three Years

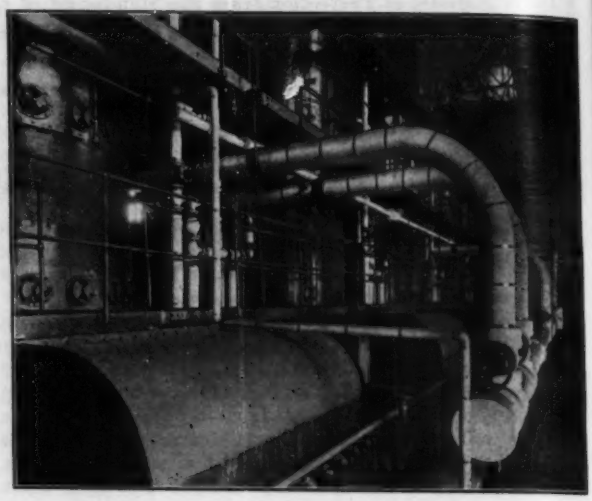
"The power plant should pay for itself in three years' time," remarked Charles E. Nelson, president of the MacSimBar Paper Company. "The building and equipment represent an outlay of $300,000 and, according to available reports and very conservative estimates, we will save over $100,000 in operating expenses the first year. That provides for every possible item that can be included, i. e., labor saving, coal saving and depreciation. The net saving will be in excess of $1.50 a ton for each ton of paper made. I have always been a firm believer in the old theory that the cost of paper begins at the coal pile. For that reason I have always insisted on proper power house equipment for any successful mill."

FRONT VIEW OF BATTERY OF BOILERS

Mr. Nelson further stated that the installation of the new power plant had resulted in an increased output of board from 150 tons every 24 hours to 170 tons, simply through the ability to operate the big machines at a high speed.

New Pumping Station

Coincident with building the power plant, the MacSimBar Paper Company, also erected a pumping station to insure adequate boiler feed water supply. It is a one-story brick structure, about 40 feet square, and is equipped with two Union Steam Pump Company's pumps, also a steam turbine direct connected with a centrifugal pump, to insure reserve power. In this division there is a water heater, product of the Colles Heater and Specialty Company, Chicago, and a grease extractor made by Blackburn-Smith. The MacSimBar Paper Company in years past has drawn its boiler feed water from the Kalamazoo River, but that stream now contains so much foreign matter that two wells have recently been sunk and two large storage tanks erected by the Kalamazoo Tank and Silo Company, thus insuring a purer supply, though sufficiently limey in nature to require softening.



REAR VIEW OF BATTERY OF BOILERS

DONNACONA PAPER CO. TO DOUBLE CAPACITY

The Donnacona Paper Company, of Donnacona, Que., is breaking ground this month for important additions which will include the installation of a 234-inch news print machine built by Chas. Walinsley & Co. of Bury, England, and which will practically double the capacity of the plant. The new machine is expected to be in operation by January, 1924.

The new power house, 31 x 130 feet, will contain a generator and four 1,500 h.p. motors, driving four new lines of grinders. There will also be provision for one additional motor. This will also contain all transformers and switchboard.

The new grinder room, 50 x 130 feet, will contain four lines of grinders, three stones on a line, with provisions for a fifth line in the future. This room also contains a wood storage tank and conveyors.

The new ground wood screen room will be 44 x 62 feet. Half of this room will be three stories high, and the other half one story. This room will contain six motors, twelve centrifugal screens and twelve deckers; also necessary white water pumps. The basement of this room is a ground wood decker stock chest.

The Beater room will be 56 x 65 feet, the basement containing ground wood and sulphite storage chests. The main floor will be used for storage, and half as a part of the machine room to accommodate the large machine.

The machine room, including half of beater room, will be 83 x 301 feet and will contain the 234 paper machine.

The finishing room will be 83 x 100 feet and will take care of the extra output.

All the engineering and construction work is being done by the company.

Making Pulp from Florida's Saw Grass

Grass Pulp & Fiber Corp., After More Than Two Years Spent in Perfecting Its Processes and Building Operations, Starts Its Plant on the Shore of Lake Griffin, at Leesbury, Fla.—Raw Material, Which Is Said to Produce a Superior Quality of Paper Making Pulp, Is Available in Unlimited Quantities—Method of Preparing the Saw Grass Perfected by C. F. Logan, Well Known Paper Mill Engineer.

Specially Written for the Annual Number of the Paper Trade Journal by James F. Hobart

After more than two years spent in building operations and in perfecting its process the Grass Pulp and Fiber Corporation has completed its plant for the manufacture of pulp from the saw grass of the vast swamps of Florida. The plant, which comprises thirteen buildings and covers about five acres, is located on the shore of Lake Griffin at Leesburg, Fla., where unlimited raw material, said to be unexcelled for paper making pulp, may be had for the taking.

Controls Large Grass Areas

The source of material from which this company draws its supply is about 14,000 acres of saw grass in Lake Griffin, which will yield about 35 tons to the acre and can be cut twice a year if necessary. The corporation also controls millions of acres of saw grass in the Everglades which will yield untold millions of tons of saw grass fiber. Not only does this corporation control absolutely the grass lands and waters, but it has actually paid thereon, yearly County and State taxes, thereby perfecting its title to unlimited grass fiber stock.

In some places saw grass grows from twelve to fourteen feet high and produces up to 36 tons per acre per cutting, which may be repeated yearly, and in some instances twice yearly, as long as the grass is cut above the water level. Saw grass comes back without cultivation, and may be harvested any time of the year.

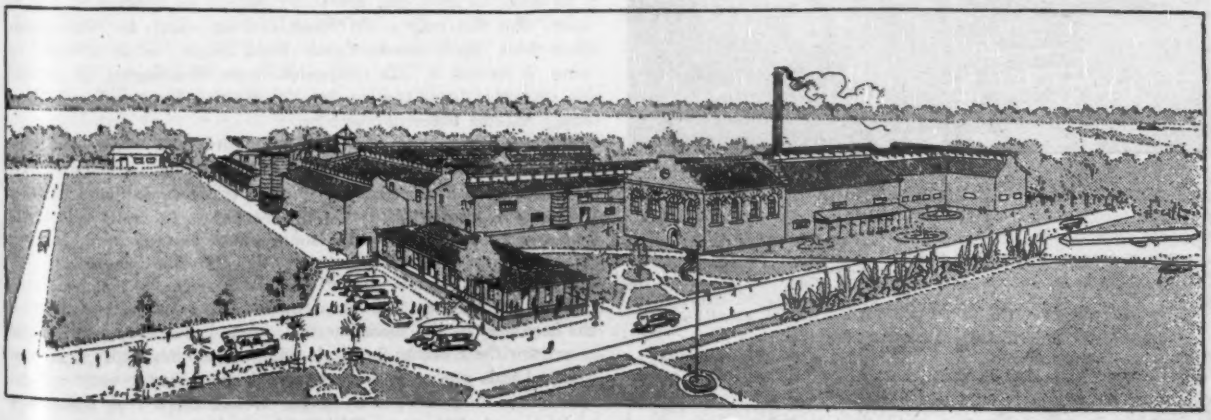
The Harvester

To harvest such a mass of grass, and to handle it and put it into condition to be treated in digesters, was a problem which the highest engineering talent of the country was called upon to solve. The outcome was the design and construction, after two years' effort, of a most unique apparatus possessing some combined characteristics of a Mississippi River steamboat, a World War tank, and a McCormick grain reaper—and it does the work to perfection, travels under its own power on land, water or mud, and reaps a sixteen-foot swath of saw grass which is drawn inboard, cut into three-inch lengths, blown into the wire-enclosed deck space of a tender, which, when loaded, is towed to a lighter in deep water, and the saw grass is blown into the lighter, which, when fully loaded, is towed to the landing beside the factory grass house.

The barge which forms the "Harvester" is built of steel and is 10 feet 6 inches beam and 45 feet long. It is 65 feet from cutter bar to tip of stern wheel, which will drive the harvester about five miles an hour under its own power. It is proposed to use a tug to increase the speed of the harvester when it has to travel considerable distances, also to move the tenders and the lighters. The tenders, however, are fitted with caterpillar tractors, the same as the harvester, and move alongside of the harvester and receive the chopped grass when the harvester is at work.

The harvester is fitted with two caterpillar tractors, one on either side, something like those used on the longest water tanks. By means of the connecting frame containing the traveling apron, the cutter-bar may be raised or lowered several feet so that grass may always be cut just above the water line. If the grass be cut below that level, it fails to come back for several months, or even years.

The two tractors enable the harvester to make its way along on land or mud where there is not water enough to float it or to use the stern wheel for propulsion. The weight of the harvester is approximately forty tons, and it has a draft of less than three feet of water. By means of its sixteen-foot cutter bar, the harvester can cut sixty tons of saw grass per hour. The grass as cut falls upon the apron and is carried into a set of rolls which draws the grass endwise and sends it through the cutters which chop the grass into three-inch pieces, after which the grass is blown into the tender which travels alongside of the harvester.



General View of Plant of the Grass Pulp & Fiber Corp., Leesburg, Fla.

The power equipment of the harvester consists of one 80 H.P. and one 40 H.P. truck motors, the former handling the cutter-bar, squeeze-rolls, chopper and blowing fans. The latter (smaller) motor drives the stern wheel and motor treads. The latter are geared to a ratio of one to 400 of the motor.

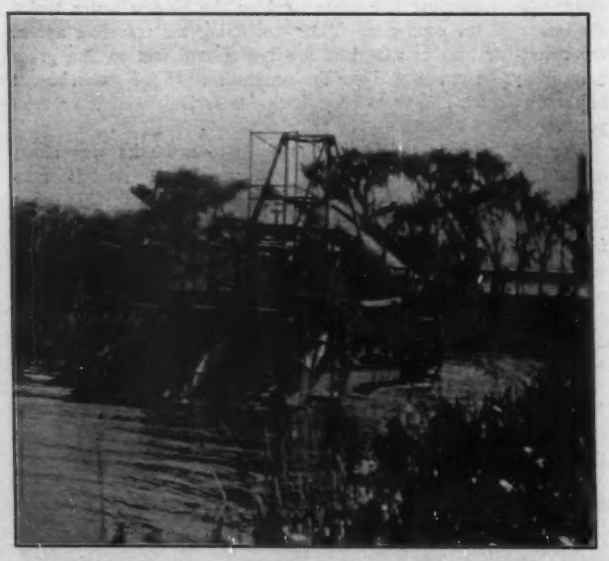
The tender boats or barges run alongside of the harvester while it is at work, and receive the chopped grass which is blown into them. There will be at least two, and perhaps three tenders, each of capacity when loaded, of about 30 tons of chopped grass. When full, the tender proceeds to deep water, being provided with tractors and can go anywhere—on the marshes, on dry land or on the lake. Arriving at deep water, the tender discharges its load of grass into a lighter, of which there are to be several, each of which will hold from two to three tender loads, or from 60 to 90 tons of grass each.

Each tender contains unloading machinery in its hold, consisting of a double exhaust fan and steel conveyors. The latter are buried in the load of grass, and are provided with concealed steel covers which can be drawn and expose the cut grass to fan suction, by means of which, and after passing through the fans, the grass is discharged to the lighter which brings its load of grass to the plant.

The Grass Storage House

At the head of the lighter canal each grass-loaded lighter is tied up to the dock close to a fan-house in which is located an exhaust fan which sucks the grass from the lighter and blows the cut grass through 36-inch pipe into a 600-ton grass house, 24 feet from ground to plates. Grass is delivered into a cyclone collector room on top of the grass house.

Normally, the grass will fall directly upon the big conveyors which carry the material from grass house to digester house, the 600-ton grass house being merely a safeguard to ensure a supply



SHOWING HARVESTER LEAVING ITS DOCK AND PULP MILL IN THE DISTANCE

of grass in case of a storm on the lake or accident to the harvester. Cut grass may be fed to the conveyors either direct from the cyclone room or from storage in the grass house.

The Digesters

The all-steel digester building contains at present one digester, with space for one more, and with room adjoining for additions to the building for other digesters, until eight shall have been placed in position, giving a capacity of 100 tons of high grade dry pulp each day of twenty-four hours.

The digester is of the spherical type, eighteen feet in diameter, and the largest of its kind in existence, weighing about 110,000 pounds when empty. The digester is made to revolve by power while starting to cook the charge of saw grass. It is also fitted with a "circulating" tube by means of which, when desired, the charge, after being heated during rotation of the digester, may be

HARVESTER LEAVING WATER TO TRAVEL ON LAND

cooked with the digester at rest in a manner somewhat similar to that of an old-fashioned "tub" bleach, the liquor being spouted or "circulated" over the charge of grass by steam pressure, the liquor finding its way back to the bottom of the digester by gravity, to be repeatedly blown over the stock again by geyser-like action of steam in the circulating tube.

It may be of interest to pulp men to know that C. F. Logan, the chief engineer of this concern, is the inventor of the above-described "Circulating Apparatus for Circulating Caustic Liquor in Vertical Digesters." Mr. Logan took out patents upon this invention which he perfected in 1885 while superintendent of The Ticonderoga (N. Y.) Chemical Pulp plant, and since then a majority of the soda pulp mills in the United States and Canada, and as far away as India, have his circulators in use.

Grass Fiber Pulp No Accident

In order to show that grass fiber pulp is no accident, it may be stated that this pulp is the result of long search for fibers other than those from wood. Cyrus Field Logan, when officially at home, is located at 1228 Crittenden street, Washington, D. C., and his stationery bears the legends: "Consulting Engineer" and "New Paper Making Fibers a Specialty."

His long years of research and practical mill experience seem about to be crowned with success in the placing upon the market unlimited quantities of a substitute for paper stock that is neither rag or wood, and which it is said bids fair to be found both equal and superior to wood pulp for any grade of paper.

Pulping the Grass

From the digester, with its circulator, after the charge of grass has been cooked, the spent liquor is pumped into tanks outside, and at present the cooking chemicals will not be reclaimed. A sort of modified soda process is being employed under low pressure exhaust steam, less than 15 pounds gage. It is expected to make four cooks in each digester per 24-hour day.

The six-hour (or less) digester-cook under about 15 pounds steam pressure yields from 50 per cent of low quality to 25 per cent of high quality pulp, fit for writing or other papers. The low quality pulp is to be used for containers, wall-board, and similar products.

The cooked grass is discharged upon the floor of the digester house directly above a conveyor which moves the grass to a bucket elevator, by means of which it is elevated to the top of the building from whence it moves to two 36-inch by 12-feet Baker washers and a knotter.

From the washers the pulp passes through a system of pumps and pipes from one bleaching tank to another, and eventually to the Jordan or to the wet machine. By an ingenious arrangement the pulp is made to flow from one tank to another by gravity until the level of material in each tank is nearly equalized, then pumps are used to fill the upper portion of the tank.

The Bleaching Process

Bleaching is accomplished by a process worked out especially for saw grass fiber, and the method or process is one of the valued and guarded assets of this corporation. It was finally worked out after long experiment and much discouragement, and was at last accomplished after having been given up in despair of being able to bleach saw grass. As Chief Engineer Logan stated: "We had tried everything we could think of, again and again and in every possible way, and had abandoned bleaching grass pulp as not practical, when a simple chemical was thought of, and one more bleaching trial was made before abandoning the matter permanently." And, Mr. Logan added, "It worked, and the problem was solved."

The next step is to pass the pulp into the bleaching (secondary) agitator tanks, eight in number, and capable of containing 25,000 gallons of solution each. Here the proper chemicals are added for bleaching the pulp to whatever grade is desired.

From the bleaching tanks pulp is piped, always in solution, through pumps which will deliver solid and continuous six-inch streams, either to a big Jordan engine, if fine pulp is required, or direct to a 36-inch by 90-inch two-cylinder Sandy Hill wet machine with a capacity of 50 tons per day, with provision for adding two more cylinders when required. This machine, located in the main building, delivers a continuous sheet or web of pulp to a mammoth dryer, 55 feet long, ten feet wide and ten feet high and containing 13,000 feet of one-inch steam pipe in coils, built somewhat upon the principle of dryers employed by textile mills. Later, it is hoped that a description of this piece of apparatus can be given to PAPER TRADE JOURNAL readers.

Eventually the wet machine will be given four or six cylinders and the dryer capacity doubled.

Provision has been made for shipping wet or dry pulp as necessary, in sheets, rolls, bales or bundles, according to the use to which the pulp is to be put. For local use, by subsidiary companies, it is probable that considerable moist pulp will be shipped, to be later molded and dried into crates, containers and a thousand shapes which will be required in the vast field which is being developed for local uses of grass fiber pulp.

Some of the Problems Solved

Some of the chemical problems which have been worked out are the bleaching process; treatment of fiber for different purposes; water-proofing and strengthening of fibers for the manufacture of fruit, vegetable and other containers. Constant outlook is being made for new uses for saw grass fiber pulp and, judging from the work already accomplished, the field is very broad and only stops with the imagination, to quote the words of Chemist Frank E. Morgan, who further says that "every day unfolds a new use for the fiber, or a new process makes the fiber suitable for uses which the general public has as yet never dreamed of."

Officers of the Company

The corporation which has made this unique addition to the pulp and paper industry of America has the following officers: W. S. McClelland, president; E. R. Lacy, vice-president and general manager; R. F. E. Cook, treasurer; Gilbert D. Leach, assistant treasurer; Charles E. Daniels, secretary; C. F. Logan, chief engineer; J. H. Ford, mill superintendent; Frank E. Morgan, chemist.

The financial end of this new business venture was successfully handled by the vice-president and general manager, E. R. Lacy, and the chemical and mechanical equipment of the plant and the perfecting of the processes was in charge of the chief engineer, C. F. Logan, both of whom were assisted by an able staff.

MANUFACTURE OF PAPER AND WOOD PULP IN U. S., 1921

The Department of Commerce announces that according to reports made to the Bureau of the Census the value of products of establishments engaged primarily in the manufacture of paper and wood pulp amounted to $667,436,000 in 1921 as compared with $788,059,000 in 1919, and $332,147,000 in 1914, a decrease of 15 per cent from 1919 to 1921, but an increase of 101 per cent for the seven-year period 1914 to 1921.

Of the 726 establishments engaged in the industry in 1921, 495 manufactured paper only, 62 wood pulp only, and 169 both paper and wood pulp. The total production of paper in 1921 was 5,386,000 tons valued at $585,735,000; in 1919, 6,099,000 tons valued at $673,049,000; in 1914, 5,270,000 tons valued at $291,588,000.

In 1921, 543, or 75 per cent, of the total number of establishments reporting were located in 9 states as follows: New York, 155; Massachusetts, 69; Wisconsin, 62; Pennsylvania, 58; Ohio, 50; Michigan, 39; Connecticut, 38; Maine, 37; and New Jersey, 35.

In February, the month of maximum employment, 112,585 wage earners were reported, and in May, the month of minimum employment, 96,722, the minimum representing 86 per cent of the maximum. The average number employed during 1921 was 10,050 as compared with 11,005 in 1919 and 6,838 in 1914.

The figures for 1921 are preliminary and subject to such change and correction as may be found necessary from a further examination of the original reports.

The statistics for 1921, 1919, and 1914 are summarized in the following statement:

	1921	1919	1914
Number of establishments	726	729	718
Persons engaged	115,430	124,935	95,516
Proprietors and firm members	86	171	221
Salaried employees	10,050	11,005	6,838
Wage earners (average number)	105,294	113,759	88,457
Salaries and wages	$156,118,000	$165,643,000	$66,164,000
Salaries	29,089,000	29,953,000	12,918,000
Wages	127,029,000	135,690,000	53,246,000
Paid for contract work	3,112,000	487,000	540,000
Cost of material	445,992,000	467,483,000	213,181,000
Value of products	667,436,000	788,059,000	332,147,000
Value added by manufacture[1]	221,444,000	320,576,000	118,966,000

[1]Value of products less cost of materials.

DETAILED STATISTICS OF PRODUCTS FOR 1921 AND 1919 ARE GIVEN IN THE FOLLOWING TABLE. (QUANTITY—TON, 2,000 POUNDS)

Total value of products	$667,436,000	$788,059,000
NEWSPAPER, IN ROLLS AND SHEETS:		
Tons	1,237,000	1,324,000
Value	$114,315,000	$98,560,000

HANGING PAPERS:		
Tons	57,000	69,000
Value	$5,933,000	$6,043,000
POSTER, NOVEL, TABLET, LINING, ETC.:		
Tons	35,000	80,000
Value	$4,173,000	$7,273,000
BOOK PAPER:		
Book, machine finished—		
Tons	448,000	533,000
Value	$75,124,000	$76,773,000
Book, sized and supercalendered—		
Tons	199,000	286,000
Value	$29,183,000	$41,498,000
Coated—		
Tons	98,000	132,000
Value	$18,624,000	$24,010,000
Plate, lithograph, map, woodcut, etc.—		
Tons	15,000	10,000
Value	$2,562,000	$1,556,000
COVER PAPER:		
Tons	16,000	22,000
Value	$4,112,000	$5,643,000
FINE PAPER:		
Ledger and highest grade—		
Tons	13,000	31,000
Value	$6,505,000	$12,255,000
Pole dried—		
Tons	49,000	49,000
Value	$13,208,000	$19,869,000
Air dried—		
Tons	21,000	29,000
Value	$6,899,000	$9,515,000
Machine dried—		
Tons	37,000	60,000
Value	$8,426,000	$14,665,000
Sulphite bond—		
Tons	74,000	82,000
Value	$16,461,000	$17,484,000
All other—		
Tons	37,000	75,000
Value	$9,415,000	$13,953,000
WRAPPING PAPER:		
Manila (rope, jute, etc.)—		
Tons	94,000	112,000
Value	$12,004,000	$15,493,000
Heavy (mill wrappers, etc.)—		
Tons	44,000	136,000
Value	$3,901,000	$11,315,000
Bogus or wood manila, all grades—		
Tons	127,000	126,000
Value	$14,090,000	$12,047,000
Kraft—		
Tons	174,000	193,000
Value	$22,662,000	$26,575,000
All other—		
Tons	226,000	265,000
Value	$34,074,000	$37,639,000
BAG PAPER (ALL KINDS):		
Tons	105,000	(a)
Value	$13,857,000	(a)
TAG STOCK (ROPE, JUTE AND SULPHITE):		
Tons	19,000	27,000
Value	$2,723,000	$5,460,000
BOARDS:		
Wood pulp—		
Tons	139,000	180,000
Value	$11,007,000	$14,888,000
Straw—		
Tons	186,000	228,000
Value	$10,702,000	$12,230,000
News—		
Tons	136,000	89,000
Value	$6,345,000	$4,604,000
Binders', trunk and press—		
Tons	33,000	43,000
Value	$3,180,000	$3,788,000
Cardboard, bristol-board, card middles, tickets, etc.—		
Tons	195,000	85,000
Value	$14,124,000	$11,104,000
Leather—		
Tons	22,000	28,000
Value	$1,555,000	$2,263,000
Chip—		
Tons	594,000	696,000
Value	$26,581,000	$37,749,000
All other—		
Tons	436,000	518,000
Value	$30,853,000	$37,464,000
TISSUE PAPER:		
High grade—		
Tons	25,000	31,000
Value	$6,876,000	$11,138,000
White, colored and waxing—		
Tons	46,000	37,000
Value	$7,793,000	$7,645,000
Manila and No. 2 white—		
Tons	29,000	24,000
Value	$4,541,000	$3,589,000
Towel and napkin—		
Tons	25,000	19,000
Value	$4,017,000	$5,145,000
Toilet—		
Tons	61,000	80,000
Value	$10,420,000	$13,179,000
BLOTTING PAPER:		
Tons	12,000	13,000
Value	$2,667,000	$3,209,000
BUILDING, ROOFING, ASBESTOS AND SHEATHING PAPER:		
Tons	216,000	195,000
Value	$12,806,000	$17,737,000
ALL OTHER PAPER:		
Tons	66,000	192,000
Value	$13,617,000	$29,691,000
WOOD PULP FOR SALE OR FOR CONSUMPTION IN MILLS OTHER THAN THOSE IN WHICH PRODUCED:		
Tons	868,000	1,100,000
Value	$63,374,000	$80,095,000
Ground—		
Steamed—		
Tons	36,000	61,000
Value	$1,657,000	$2,225,000
Not steamed—		
Tons	264,000	285,000
Value	$10,421,000	$9,504,000
Soda fiber—		
Tons	107,000	169,000
Value	$11,452,000	$14,939,000
Sulphite fiber—		
Bleached—		
Tons	209,000	289,000
Value	$21,472,000	$31,715,000
Unbleached—		
Tons	189,000	228,000
Value	$14,492,000	$17,792,000
Sulphate fiber—		
Tons	51,000	44,000
Value	$3,579,000	$3,136,000
Screenings—		
Mechanical—		
Tons	1,000	2,000
Value	$29,000	$34,000
Chemical—		
Tons	11,000	22,000
Value	$272,000	$750,000
All other products, value	$18,327,000	$34,915,000
WOOD PULP		
Quantity produced (including that used in mills in which manufactured), total tons	2,876,000	3,518,000
Ground—		
Steamed, tons	147,000	282,000
Not steamed, tons	1,112,000	1,237,000
Soda fiber—		
Bleached, tons	279,000	384,000
Unbleached, tons	22,000	28,000
Sulphite fiber—		
Bleached, tons	418,000	510,000
Unbleached, tons	721,000	910,000
Sulphate fiber—		
Bleached, tons	15,000	28,000
Unbleached, tons	126,000	92,000
Screenings—		
Mechanical, tons	8,000	12,000
Chemical, tons	28,000	35,000

[a] Not reported separately.

MAGNOLIA PAPER CO. TO EXPAND

Ground was broken recently for a modern, fully equipped three-story addition to the plant of the Magnolia Paper Company, adjoining the new Crockett Street viaduct, Houston, Tex. The addition will be 50 by 100 feet.

In addition to the new building, new equipment for the manufacture of folding cartons and set-up boxes will be installed in the plant. New machinery also will be installed in the printing plant of the company. Officials of the company state that the increase in room and equipment has been made necessary by steadily increasing demand for their products.

The Magnolia Paper Company will celebrate its twenty-first year in Houston on May 1. The trade territory covered by the firm embraces all of Texas, Louisiana, Oklahoma, New Mexico and Arizona.

Trade Banquets During Convention Week

American Paper and Pulp Association, National Paper Trade Association of the United States, and Salesmen Association of the Paper Industry Dine at Waldorf-Astoria—Technical Association of the Pulp and Paper Industry Holds Its Annual Banquet at the Astor—Waste Material Merchants' Association of New York City Has Banquet at the Commodore—All These Functions Are Largely Attended.

Coming as a fitting climax to a week brimful of vigorous activity, the Forty-sixth Annual Banquet of the American Paper and Pulp Association was held Thursday night in the Grand Ball Room of the Waldorf-Astoria, New York. Nearly 800 paper and pulp manufacturers, converters, dealers, paper stock men, and representatives from practically every branch of the paper or allied trades crowded the expansive banquet hall for the dinner which put the finishing touches to a Convention Week whose success has been unparalleled since the inception of the Association, nearly half a century ago. From every standpoint the annual dinner accomplished its aims. Aside from the sumptuous feast it afforded paper men, weary from a week of arduous, constructive discussion, and not taking into consideration the recreational and social features which could not fail to assert themselves when eight hundred of the nation's most representative paper and pulp men assembled in a single hall, to partake of the same food, renew old acquaintances and hear the same inspirational speeches, but in the caliber of the few men who were chosen to address the assemblage, was the occasion of the banquet justified.

The Forty-sixth Annual Banquet was, in many ways, unlike any of those which preceded it. In the first place, with the exception of the speech of James M. Beck, Solicitor-General of the United States, the word "paper" was used but sparingly. From the general character of the addresses as well as from the demeanor of the crowd it would have been difficult for an outsider to determine the nature of the banquet. The keynote of the introductory remarks made by Walter J. Raybold, retiring president of the Association, and Toastmaster of the evening, was the fundamental importance of trade organizations in general. That of Solicitor-General Beck was "What Ails Human Society?" and the *piece de resistance* of the evening was a thoroughly political, but equally Republican oration on the necessity of establishing a court for the arbitration of international problems, by no less distinguished a personage than the Hon. William E. Borah, United States Senator from Idaho. The Rev. Dr. Nehemiah Boynton, who was introduced by the toastmaster as "spiritual adviser" of the American Paper and Pulp Association concluded the offerings from the speakers' table with an inspirational sermon. Thus the subject of paper, after having had more than its due share of attention in the course of the convention preceding, was submerged for the evening in favor of general topics of national and world-wide interest.

W. J. Raybold, Toastmaster

"The real important work of a trade organization," said Mr. Raybold, for the past two years president of the Association, "is the development of character, personality and confidence in each other among its various members. In the promotion of constructive, friendly competition it serves its best purpose." Before the above remarks, Mr. Raybold requested that the diners rise and sing a verse which had been especially written for the occasion, to the tune of "Till We Meet Again." This suggestion was heartily complied with, the enthusiasm of the banqueters leading them to repeat the stanza voluntarily, adding the irrepressible, "And she lives down in our al-ley!", an appendage which was suffixed every song throughout the evening. So chronic had this habit become that when Henry W. Stokes, the incoming president of the Association was introduced by the master of ceremonies, the assembled paper men rising from their chairs to greet him with "He's a jolly good fellow!", from some quarter of the ball room there started, "And he lives down in our al-ley!"

Incoming Officers Introduced

A precedent was established in the introduction of the various incoming officers of the organizations. Following Mr. Stokes, Norman W. Wilson, of the Laurentide Company, Montreal, Que., was presented by the chairman under the new title of "Eastern Vice-president of the Association." W. J. Randall, the newly elected western vice-president, Mr. Raybold announced with regret, was unable to be present owing to the fact that he had been called back West the day preceding the banquet. The new officers made no speeches whatever, merely rising from their positions at the speakers' table to accept the recognition tendered by the assemblage.

Solicitor-General Beck Speaks

Immediately after being introduced, Solicitor-General Beck capitalized upon this by saying that both he and Senator Borah, "the distinguished Senator from Utah," he erred, regretted that their position made it impossible for them to hold their speeches to the same concise brevity as those of the Association's newly elected officers, or to manifest so genuine a consideration for the feelings of the audience. Pandemonium reigned amongst the banqueters for several minutes after Mr. Beck had geographically misplaced his close friend and supporter, the Senator from Idaho, and as though to make amends, perhaps the first ten minutes of his speech were devoted to a eulogy of "America's best known progressive" and "the greatest speaker in any deliberative body using the English language as its mother tongue."

Mr. Beck spoke a while on the importance of paper to civilization. "All institutions, governments, arts, and sciences, were conditioned upon the invention of a simple expedient for the transmission of thoughts from generation to generation," he said, adding that this substance was first discovered several thousand years before the time of Tut-Ankh-Amen, at which time papyrus came into use as a media for the transmission of thought. After observing that approximately 29,000,000,000 individual copies of newspapers were printed each year in the world today, however, Mr. Beck challenged the amount of genuine information that could be gleaned from what he termed the "jumble of newspaper facts." Mr. Beck employed a clever simile of a man who attempted to animate his wooden leg by

PICTURE TAKEN AT THE FORTY-SIXTH ANNUAL BANQUET OF THE AMERICAN PAPER AND P[ULP] ASSOCIATION

OCIATION AT THE WALDORF-ASTORIA HOTEL, NEW YORK, THURSDAY EVENING, APRIL 12, 1923

ANNUAL DINNER OF THE TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY AT THE ASTOR HOTEL, TUESDAY EVENING, APRIL 10, 1923

means of electric power, but soon discovered that his mechanically operated limb was too powerful properly to co-ordinate with the real one. "One of the fundamental ailments of human society today," concluded Mr. Beck, "is that man cannot co-ordinate his spirit and physical abilities with the mechanical potentialities and the ingenuity of the artificial contrivances which he employs.

Views of Mr. Beck

A radio amplifier was on the table before Mr. Beck. "As wonderful as it may seem to know that every tone—every accent that I pronounce may be broadcasted five hundred or a thousand miles from this spot," he said, "still it must be borne in mind that this merely represents the progress of invention and mankind's mechanical leg. The power of paper and ink is far greater. With them the very substance of the human mind may be represented. No matter how far or how loud the world I speak may be amplified, it does not necessarily follow that the importance of those words or the thoughts they represent are amplified correspondingly.

Mr. Beck expressed the view that the intellectual activity of the younger generation of today was practically a minus quantity as compared to the standards of intelligency and aggressiveness which existed during his own youth. He scored the jumbled fashion with which news is presented to the public in the newspapers, deplored the lack of interest of the American people today in political issues, which, he averred, are now of greater consequence than they have ever been in the history of the country. He stated that half of the electorate of today was more interested in the coming baseball season or the current "movie" to cast a ballot, and regretted the fact that young men no longer marched in defense of their favorite political party as they did in Civil War times. "We all have acquired the cinematographic brain," he declared, and his panacea for the various ills which beset the world today he epitomized in the suggestion that everyone work hard and conscientiously. "All-conquering work," he wound up, "is the only sure means by which we may advance.'"

Senator Borah Speaks on World Court

"You are manufacturers of paper and I am a member of an organization which consumes a generous amount," said William E. Borah, United States Senator from Idaho, following the long speech of Mr. Beck, "so that ought to give us something, at least, in common." Following this statement, Senator Borah departed uncompromisingly from the realm of paper and resumed his debate with his several political antagonists at the point where they had been left off in Thursday evening's papers.

Spiritual Rennaissance Needed

Mr. Borah recommended that the only way in which a permanent arbitration court might be realized was through the organization for peace with the same enthusiasm as the United States prepared for war. Averring that a spiritual *rennaissance* was needed first, the Senator from Idaho questioned the motives of various European powers that are now arming themselves so heavily. "The United States must build on the foundation of government by law and not by men," he said. Senator Borah returned the many compliments paid him by the speaker who preceded him, saying that after hearing Solicitor-General Beck in a recent eloquent speech before the United States Supreme Court, he came to the immediate conclusion that if he were ever on the same program with Mr. Beck he would be quite content to speak *after* the Solicitor-General. Senator Borah's remarks met with the hearty approval of the assemblage and time and again his speech was interrupted with storms of applause.

Banquet and Reception Committees

The banquet itself, complete in every respect from Cape Cod oysters to *demi-tasse*, was arranged by the following committee: Chairman, Henry W. Stokes; G. G. Abernethy, Col. B. A. Franklin, A. S. Guggenheimer, J. W. Hurlbut, Philips Kimball, F. A. Leahy, C. R. McMillen, M. E. Moyer, R. W. Post, F. L. Scott, J. H. Stannard and A. G. Wilson. Felix Pagenstecher was chairman of the reception committee, consisting of thirty-four Association members. The reception period prior to the banquet was extended to nearly an hour and it was 8 o'clock before festivities were well under way. On all hands it was the unqualified opinion that the Forty-sixth annual banquet was by far the most successful of any which the Association has yet held.

NATIONAL PAPER TRADE BANQUET

The thirteenth anual banquet of the National Paper Trade Association of the United States, held in the Waldorf-Astoria, Wednesday evening, April 11, was the largest and one of the most brilliant social affairs ever held in the history of that organization.

About 400 diners were seated in the Grand Ball Room, where the banquet was served and where later a very excellent program was given by some of Broadway's best known entertainers.

The banquet tables were decorated with red tulips, whose deep hues, lent much color to the appearance of the scene. The banquet room was hung with American flags, artistically draped from walls and boxes. A handsome package of cigars was at each place, as well as beautifully engraved book programs, which carried the names of the officers of the association as well as the menu and the program of the evening's entertainment.

A splendid feature of the evening was the spontaneous singing of the diners, inspired no doubt, by the orchestra's excellent rendition of old time and popular songs. In fact, the entire occasion seemed unusually rife with good feeling and enjoyment.

The Ned Wayburn Office through its Master of Ceremonies, Arthur West, presented a program seldom equalled off the legitimate stage for the high calibre artists who participated in it. Mr. West himself came in for no little applause for his several song numbers. Will Rogers, America's best known and most popular monologist was easily the brightest spot in a very bright evening. Mr. Rogers' knowledge of the paper industry, especially in its relation to the leather and other industries, was remarkable.

Dancing followed in the Astor Gallery until a late hour.

TECHNICAL ASSOCIATION BANQUET

The Eighth Annual Dinner of the Technical Association of the Pulp and Paper Industry, held at 7:30 p. m. in the Hotel Astor Tuesday evening, was one of the most successful and well attended affairs which the association has enjoyed since its inception. A goodly proportion of the 250 present were ladies and there was a much larger representation than in any preceding year. Paper and pulp technical experts from all parts of the country were in attendance and in the short reception preceding the dinner many old acquaintances were renewed.

Owing to the fact that Judge C. F. Moore, of the Seaman Paper Company, designated as toastmaster, was unable to be present due to his illness, George E. Williamson, of the Strathmore Paper Company, Mittineague, Mass., and president of the association, acted in the capacity of master of ceremonies. When the last vestiges of the tastefully prepared dinner had been cleared away and the men had taken to their cigars, Mr. Williamson expressed the regret of the association that Judge Moore could not be present and read a message from the latter which greatly met the approval of those present.

First on the list of speakers for the evening was Dr. Otis Caldwell, director of the Lincoln School. His talk on "Education for Modern Life" was interestingly presented and judging from the generous applause which he received, his sentiments were reflected by many in the assemblage. Dr. Caldwell was succeeded by H. S. Person, president of the Taylor Society, whose keynote was "efficiency." Mr. Person spoke on "Opportunities and Responsibilities of Technical Men." Following this, L. W. Wallace, executive-secretary of the Federated American Engineering Societies, delivered a force-

ANNUAL DINNER OF THE SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY AT THE WALDORF-ASTORIA HOTEL, NEW YORK, TUESDAY EVENING, APRIL 10, 1923

ful address on "The Elimination of Waste in Industry." Mr. Wallace has long been noted for his extensive researches into waste elimination and the salient points of his speech were closely followed by the assembled technical men.

One of the thoroughly enjoyable talks of the evening was the brief, impromptu address by R. S. Kellogg, secretary of the News Print Service Bureau, of 342 Madison avenue. In driving home "The Necessity for an Apprenticeship System," Mr. Kellogg used several diverting illustrations, one of which clearly proved the fundamental unsoundness of mathematical calculations. Among the various entertainment features, which were in charge of F. T. E. Sisson, a soloist provided tuneful vocal selections at various intervals during the evening.

The expressed opinion of those present was that the Eighth Annual Banquet was by far the most enjoyable they had ever attended, what with the excellent *cuisine* of the Astor, the brilliance of the individual speakers, the good judgment of the entertainment chairman and, best, perhaps, of all, the presence of the ladies.

SALESMEN'S BANQUET

An unusually large and representative number were present at the Fourth Annual Banquet of the Salesmen's Association of the Paper Industry on the Roof Garden of the Waldorf Astoria, Tuesday evening. A discussion of the national move for reforestation by Senator Pat Harrison of Mississippi and an inspiring address by Dr. Henry Clay Risner featured the occasion.

A "Get-Acquainted" reception preceded the banquet in the evening, which was pleasantly broken up by occasional dances; dancing later continuing until midnight at the close of the speaking program.

In behalf of the association, Fred Main of the Worthy Paper Company of Mittineague, Mass., presented C. K. Wadhams of Crane & Co. with a beautiful traveling bag in recognition of the fact that Mr. Wadhams has recently completed his fiftieth year as a salesman of paper, a record probably unequaled in the industry.

Philip Dodge, president of the International Paper Company, spoke briefly of the aims of the association and its accomplishments since its inception four years ago.

H. H. Reynolds, the retiring president, presided as toastmaster in a most pleasing and effective manner. Before introducing the speakers of the occasion he took occasion to characterize the success of the annual meeting as being due largely to the efforts of J. Donald McLauren and the various district chairmen.

In introducing Senator Pat Harrison of Mississippi, President Reynolds styled him as being "the father of the greatest constructive project in which the paper and pulp industry is interested that has ever been launched."

Senator Harrison sketched briefly the increasing scarcity of wood which the industry is confronted with in the northern section and told of the great resources which have only begun to be utilized in the South. He said in this connection, "Reforestation is for the good of the entire world although it is a hard thing to make the world see it."

Senator Harrison declared that the fire menace is today the greatest despoiler of our national forests and recommended that a national campaign of education be inaugurated which would reach to every school child in the country and which would teach of the value of the forests and the best ways to prevent forest fires.

The speaker paid a fine tribute to President Harding's desire for the United States to be a part of an International Court where disputes might be settled, questions adjudicated and a general feeling of fellowship and good will spread among all nations. "I am for any foreign policy which keeps in view the business expansion of this country," said he. "Such a policy cannot but increase our export trade, maintain good feeling toward us from all peoples; and more than that, it will be a move which we as the Giant of the Western World should have taken long ago.

"I promise you that if this project crystallizes into actual legislation that there will not be more than three Democratic senators who will oppose it."

Dr. Henry Clay Risner of Hoboken, N. J., gave an address filled with human understanding and high idealism in which he scored the world of today for lack of human feeling and its loss of true standards. His talk was replete with humorous incidents of his experience while a chaplain in Europe during the World War. He styled the American soldier as being the most responsive individual of whom he knew and concluded his remarks with the declaration that "All business must be built upon good will and that good will in turn must be built upon confidence."

WASTE MERCHANTS ASSOCIATION OF NEW YORK

There were no ladies present at the annual dinner of the New York Waste Merchants' Association held in the East Ballroom of the Commodore on Wednesday night. Scheduled to begin promptly at 7 P. M., the dinner readily got under way by 8.30 and after the intricacies of the seating arrangement had been mastered, there were no further hazards to distract the attention of any one of the 250 enthused participants. Conspicuous by their absence were such traditional banquet paraphernalia as a speakers' table, program of the evening, etc., nor was the evening of revelry long in getting under way. Hardly had the soup and entree been cleared away before a trio of colored jazz producers circulated in different parts of the banquet hall, the whining of the saxophones barely being outdone by the melodious clinking of White Rock bottles on the adjacent tables.

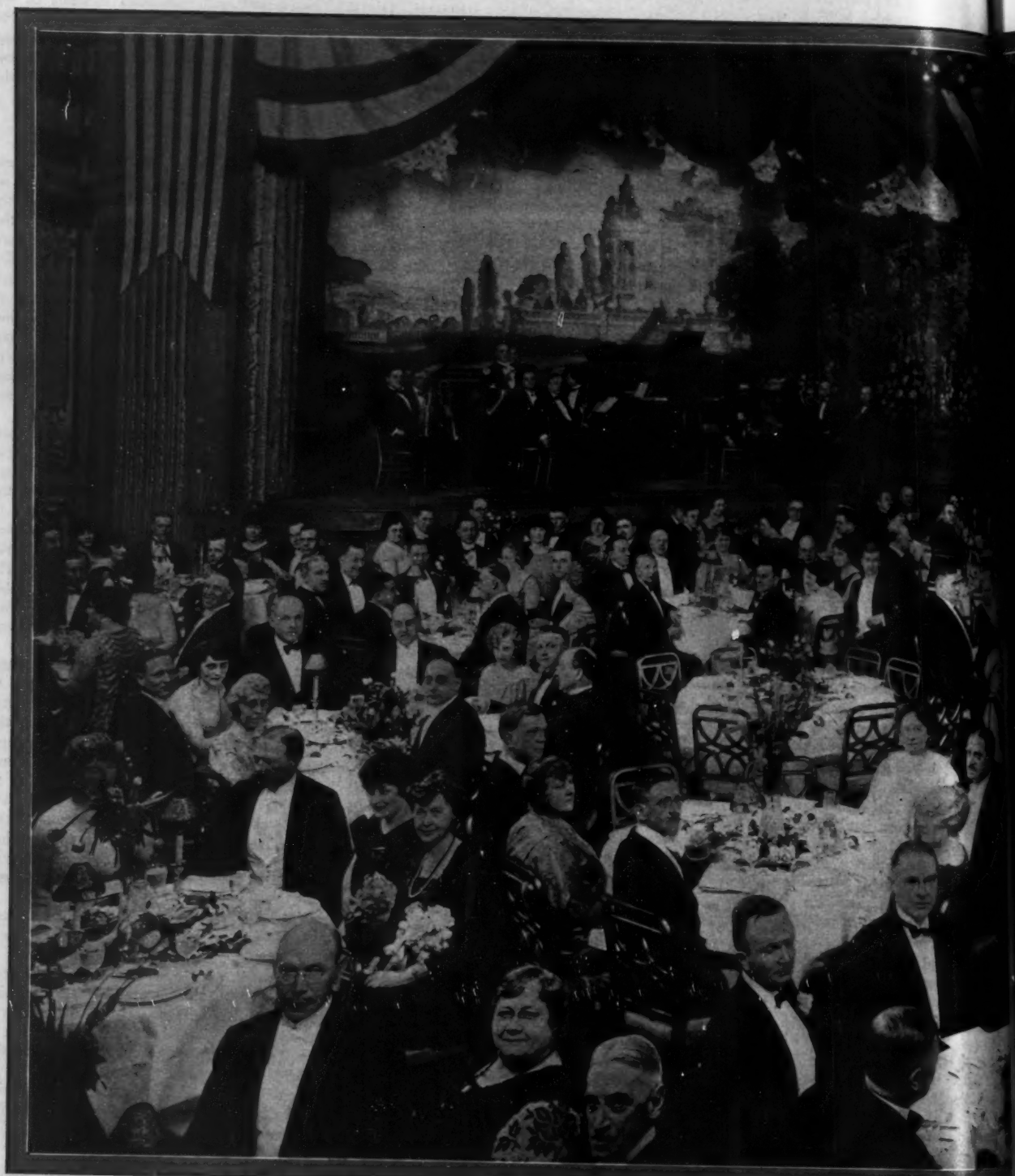
The Committee of Arrangements, under the direction of Mr. Chase of Chase & Norton, Inc., more than did justice to the occasion. The reputation which has been sustained for so many years by the Waste Merchants' Association banquet of being one of the liveliest affairs of Convention Week surely suffered no loss in prestige as a result of Wednesday night's affair. A goodly percentage of the out-of-town participants had secured rooms in the Commodore and their friends at the banquet were afforded the hospitality of these quarters and all that went with them. Table by table parties would arise and go en masse to seek some other floor for a few moments, thence to return with renewed enthusiasm for the subsequent events of the evening.

An elaborate song and dance revue was the chief feature of the entertainment program and the songs were neither too classical to escape the enthusiastic accompaniment of the assembled throng nor were the dances too difficult of interpretation to fail to elicit the heartiest bravos! from ringside tables. The spotlight arrangement, it may be said with but slight discredit to the Entertainment Committee, was such that the press table could but conjecture as to the type of amusement which was taking place on the raised platform in the center of the hall, but from occasional glimpses of the entertainers as they scurried to and from the platform and, judging entirely by the heartiness of the applause given various acts, it was the unanimous opinion of the news and trade paper men present that "a good time was had by all."

The following concerns were represented at individual tables: American Wood Pulp Corporation, Atterbury & McVelvey, Inc.; Box Board & Lining Company, Robert Blank, D. Bennedetto & Son, Chase & Norton, Inc.; V. G. Cantassano & Bros., George Carrizzo & Co., Carrizzo Bros., Darmstadt, Scott & Courtney, R. Goldstein & Son, Gaccione Bros., D. M. Hicks, Inc.; Liberty Paper Stock Company, George W. Millar & Co., J. Moliterno & Co., O'Meara, Maurice Company, Salomon Emanuel Corporation, Shea Bros., M. Stramiello, Sterling Mill Supply Company, E. B. Thomas Company, Wilson Paper Stock Company, Waste Material Corporation, G. Ragone & Son, John Lacorazza Estate, Marquardt-Hewitt Corporation, William Steck and T. Capo & Co.

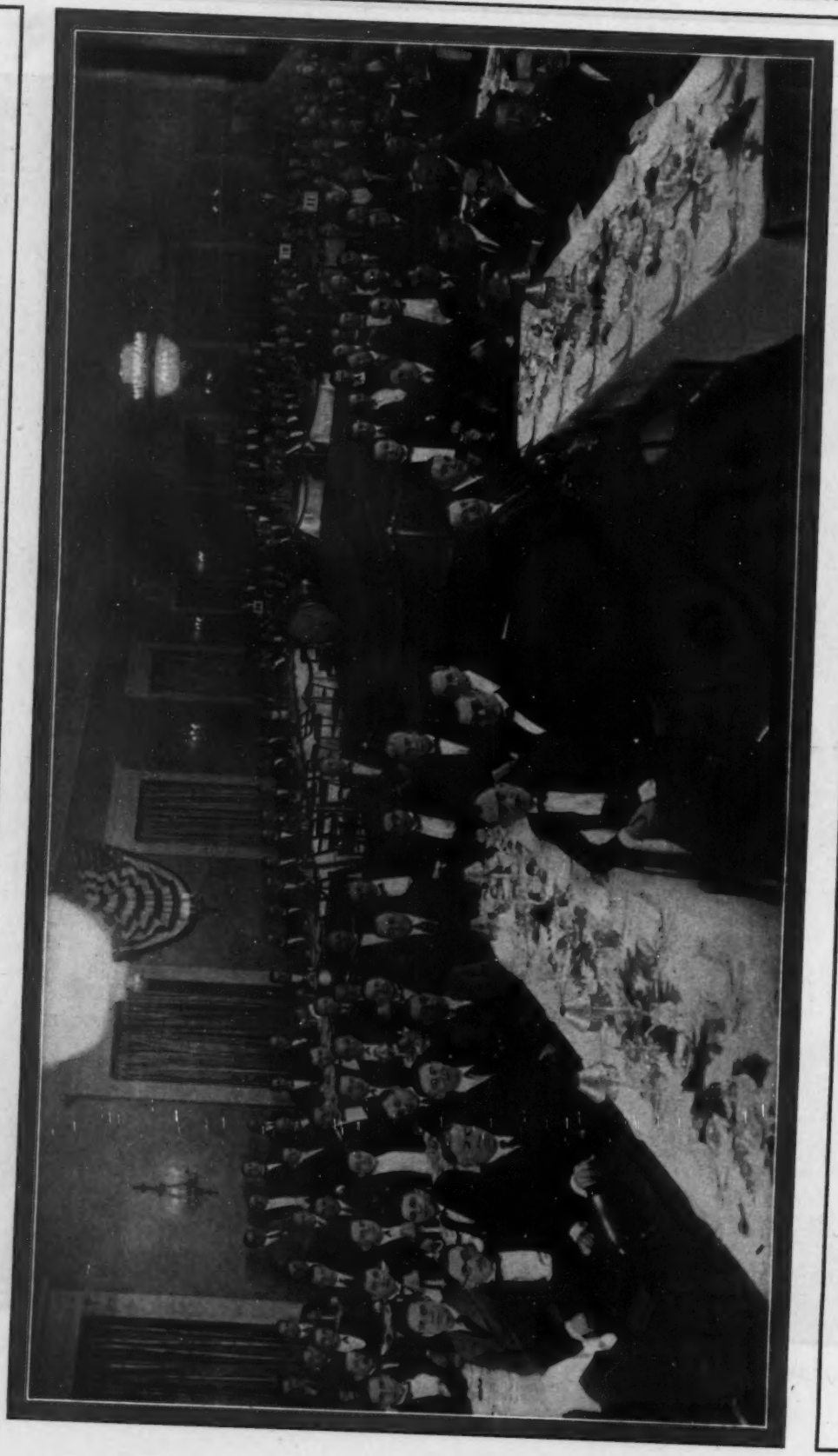
NEW SUPERINTENDENT OF ACME PAPER CO.

William E. Miller is the new superintendent of the Acme Paper Company at Reading, Pa., succeeding W. G. Kisinger, who resigned to purchase the Spencer Paper Box Company of Reading.



PICTURE TAKEN AT THE ANNUAL BANQUET OF THE NATIONAL PAPER TRADE ASSOCIATION

THE UNITED STATES AT THE WALDORF-ASTORIA HOTEL, WEDNESDAY EVENING, APRIL 11, 1923



ANNUAL BANQUET OF THE WASTE MERCHANTS' ASSOCIATION OF NEW YORK, HOTEL COMMODORE, WEDNESDAY EVENING, APRIL 11, 1923

Backus-Brooks Build Large Paper Mill At Kenora

Ground Wood Mill Already in Operation of What Is Expected to Be One of the Most Important Pulp and Paper Manufacturing Industries on the North American Continent—Excavations Now Being Made for Section of the Paper Machine Room and Finishing Room and It Is Expected That Departments Will Be Producing News Print Before End of Year—Some Interesting Equipment.

Written Especially for the Annual Number of the Paper Trade Journal

Near the outlet of the Lake of the Woods in the Town of Kenora, on land purchased from the Hudson's Bay Company, and within sight of the far-famed "Rat Portage" of song and story, over which countless voyageurs have carried their canoes and package freight for centuries, on the ancient trading route between Fort William, Eastern Canada, Lake Winnipeg, the Great Plains and York factory, there is now erected and in operation the first unit of what is expected to be one of the important pulp and paper manufacturing industries of this continent.

Ample Power and Wood Supply

Hydro-electric power for the present unit has been developed and is now being increased at the Eastern Outlet of the Lake of the Woods, and this will be added to as required by further development at the Norman Dam on the Western Outlet, and at White Dog Rapids on the Winnipeg River some thirty miles north of Kenora.

Wood supply for the present development will be secured from the Lake of the Woods pulp limit, which is directly tributary to the mills by water; also from the English River Pulp and Timber Limits located to the north. Rail connection with the last mentioned limit will be necessary and is now being planned.

The location is a most ideal one in many respects. At the site of the mill the river widens into what is known as "Rideout Bay," which affords a fine storage basin for thousands of cords of pulpwood and provides clean soft water for use in the manufacture of paper, and as boiler feed water.

Development Provided For

The mill, with the exception of the boiler house, pump house, and wood room, is situated on a hill about three hundred yards from the shore of the bay. Here enough land is available so that the development will not be restricted, and the ultimate anticipated capacity of several hundred tons of news print a day can be provided for in an efficient manner and without crowding the different departments.

The original power house was built in 1892. In 1902 the original units were discarded and three new ones installed, a fourth unit being added in 1913. In 1922 four new vertical units were installed. Power is generated at 2,400 volts, 3 phase, 60 cycles, and transmitted over two double circuits of 500,000 cables, supported on steel towers, a distance of 4,000 feet to the mill distributing substation. Power is here transformed to 550 volts and distributed to the various smaller mill motors. The main bulk of the power is carried direct at 2,200 volts to the grinder room switchboard for use on the 2,800 h.p. grinder motors. These motors are of the synchronous type, operate at 225 r.p.m., designed for 90 per cent loading power factor operation, and are manufactured by the Electric Machinery Manufacturing Company of Minneapolis. All mill motors are of Canadian Westinghouse manufacture, are operated from the 550 volt distribution system, and are straight induction motors.

At present the ground wood pulp mill, having a capacity of eighty tons per day, is completed and in operation. Excavations are now being made for a section of the paper machine room and finishing room, and these departments will be producing news print paper before the end of the year.

The mill has been efficiently designed and the engineering technique displayed in the layout is a credit to the engineering staff, of which Hardy S. Ferguson of New York is the consulting engineer.

The mill is self-contained; waste is eliminated throughout all departments. In the wood room, bark, sawdust and refuse are conveyed to the boiler house for fuel, and in the ground wood mill the bull screen rejections are re-ground by refining engines.

Wood will be received at the wood room from the water and from cars. The wood from the cars in the summer will be unloaded into Rideout Bay, and the bark allowed to soften to facilitate barking. In winter this wood will be taken directly into the wood room and circulated in a hot pond. From the hot pond it is conveyed to the drums. These drums were furnished by the Canadian Ingersoll Rand Company.

Grinder Room Equipment

The grinder room is equipped with four Standard Waterous Magazine Grinders. Each motor is directly connected to two grinders, being situated between them, so that in case of repairs or replacement of stones being necessary, the grinders can be uncoupled and the other unit operated while repairs are being made.

The stock from the grinders flows by gravity to the bull screen. The slivers are discharged to a catch basin at one end of the screen, collected and put back into the magazine and re-ground. The accepted stock from the bull screen is then pumped to the flow box ahead of two knotters, where any coarse slivers that the bull screen failed to remove, are taken out. The stock then goes through from the centrifugal screens and the tailings from the centrifugals go to tailers, while the accepted stock flows by gravity to the wet machine room. The accepted stock from the tailers goes back to the bull screen, while the tailings from the knotters and tailers go to a Claflin engine to be re-ground. The system is entirely closed, and a one hundred per cent yield from the wood is possible. No slivers, whitewater is used throughout the mill, except on the wet machine cylinders, and the wet machine felt showers. The fresh water used for pressure on the grinders discharges back into a suction tank, and is continually reused.

The wet machine room is equipped with ten wet machines and four hydraulic presses designed to operate under six hundred tons pressure, pressing the laps 58-62 per cent air dry.

The product of the mill has been sold for the balance of this year, when the paper mill will be completed.

For more than thirty years the Town of Rat Portage—now Kenora—has looked forward to the day when a pulp and paper mill would be its chief industry, and a real use made of the mighty power of the Winnipeg River at its source.

TECHNICAL ASSOCIATION MEETS

Eighth Annual Meeting of the Technical Association of the Pulp and Paper Industry Is Held at the Waldorf-Astoria, New York.

H. S. Taylor Is Chosen to Head the Association for the Ensuing Year—Standing Committees Commended for the Effective Work They Are Doing—Specially Good Work Done by the Committee on Waste—Matter of Paper Drying Also Given Considerable Attention During the Year—Gratifying Additions Made to the List of Members—Helpful and Instructive Papers Are Read by Members.

The eighth annual convention of the Technical Association of the Pulp and Paper Industry opened at the Waldorf-Astoria Monday, April 9 and continued until Thursday. There was an unusually large attendance and the papers and reports, many of which follow in succeeding pages, showed careful preparation.

PRESIDENT WILLIAMSON'S ADDRESS

President George E. Williamson then delivered the following address:

Two years ago you elected me to the office of president. I will now give you a brief account of the progress made by the Technical Association during the past year to supplement the report embodied in the president's address one year ago.

Committee Work

The real backbone of the Technical Association work is that of its standing committees. In an association like ours, in which technical information is sought and scientific methods developed, it is imperative that a large amount of painstaking research work be undertaken by the members grouped together in committees.

It is a pleasure to commend the excellent results accomplished by some of our committees. If each and every member could catch the vision of real service to the pulp and paper industry, which some committeemen posses, this work would be greatly increased. Nor does a man give much and receive little. Close co-operation with others in work in which a man is vitally interested is bound to bring real benefits to himself and to his company.

At the meeting of the Executive Committee held May 4 and 5, 1922, the standing committees were organized for the year. In the main the organizations of last year were continued, the chairmen being requested to fill vacancies and also places of members who could not or would not work, with live material.

The Coated and Processed Papers Committee, which had been inactive practically since its inception, was re-organized under the chairmanship of Edwin Sutermeister and has become one of our most enthusiastic and energetic committees. To this committee, in fact, belongs the honor of having been the first to submit its report and papers for the annual meeting.

N. F. Becker, who so ably headed the committee on Standard Methods of Testing Materials last year, found it impossible to continue to act, and Miss Helen U. Kiely was appointed chairman.

In view of the valuable nature of the work on the constitution of cellulose and its relationship to the industry, it was felt that a new standing committee on cellulose should be organized.

W. E. B. Baker, on account of his close connection with cellulose chemists both in this country and abroad, was considered the logical man to develop this line of work, and he was asked to accept the chairmanship and organize the new committee.

R. A. Hayward was appointed chairman of the committee on Sulphite Pulp vice Mr. Baker.

At the request of Ross Campbell, who has been chairman of the committee on Abtracts of Literature for several years, he has been relieved of this duty during the year, and Clarence J. West has taken over the work on Abtracts in addition to that on Bibliography, the two committees have thus been combined.

In order to handle our membership activities in a more thorough manner, a Membership Committee has been added to the group of standing committees. This committee started rather late and has not been able to do itself justice this year. For next year, I recommend that a strong and fairly large committee of energetic members be formed and assigned the task of adding to our membership many of those men engaged in technical work of some kind in the pulp and paper or affiliated industries, who are still outside the fold.

This year, for the first time, a Publication Committee has read and passed upon all papers for the Annual Meeting, except those which were received too late to permit this to be done. Some of the papers were returned to the authors for further consideration with frank criticism of their shortcomings. None were rejected, however. It must not be assumed that this committee is responsible in any way for statements contained in the papers, nor for their general quality.

Policy

Probably the outstanding feature of the year's work has been the formation of a definite policy and program of work for the year.

The Executive Committee at its May meeting decided it would be better and far more productive in results beneficial to the industry if a certain objective or definite series of projects could be attacked than to continue the comonly accepted method of associations, which is to give consideration to a series of unrelated subjects which individuals may present.

Accordingly the following subjects recommended by the Service to Members Committee were adopted and special committees formed to develop them:

1. Elimination of Waste in the Industry, Robert B. Wolf, chairman, George D. Bearce, vice-chairman.

Particular phases of this broad subject to be treated this year include:

Utilization of Barking Drum Waste.
Waste in Mill Effluent.
Broke Losses.

2. Drying of Paper, S. B. Jones, chairman.

Publications

The arrangement made with the PAPER TRADE JOURNAL last year for a Technical Section conducted under the editorship of our

secretary has proven eminently successful. As this material is printed in a form that the section may be easily removed each week from the JOURNAL and filed in special folders made for the purpose and obtainable from the Secretary's office, or in home made binders, the collection of valuable and up-to-date technical material is made very easy.

The method of numbering the pages adopted during the past year and the thorough indexing done under the direction of the Committee on Bibliography and Abstracts adds materially to the value of the publication.

It is pleasing to note that the Cost Association has followed our lead and established a section in the PAPER TRADE JOURNAL, edited by Secretary T. J. Burke. We welcome this addition to the literature of the pulp and paper industry.

Technical Association Papers, Series V, proved larger and more complete than any previous publication. Once more the wisdom of the present publication policy asserted itself and resulted in a great saving in cost to the Association.

Fall Meeting

The fall meeting held in Detroit early in October was most successful. Those who attended went for business. The program covered in addition to progress reports of standing committees simply the definite subjects selected for the year's work, namely, Elimination of Waste, and Drying of Paper. A special session was held also on Paper Testing.

Every session was largely attended and the discussions were especially good. Meetings of this character are bound to be very helpful.

Sectional Meetings

The plan of holding sectional or group meetings, first attempted two years ago, proved so successful last year that it has been continued for this Annual Meeting.

The principal disadvantage of this plan is that it does not permit members to attend all meetings in which they may be interested, but the program has been carefully arranged to afford the minimum of conflict. In no other way can the ground be covered.

Your prompt attendance at these meetings is urged on behalf of the chairmen.

Committee Meetings and Smoker

For the first time, all of the Association's committees have been asked to assemble on the opening day of the annual meeting.

One of the principal handicaps of our committee work has been the inability to meet during the year for conference and discussion of work under way. It is hoped that this attempt will be so successful this year that all committees will in the future meet at least once a year.

As a social feature to encourage committee members to become better acquainted a smoker was held last evening at the Canadian Club. I believe that those who attended yesterday's meetings and smoker feel well repaid and have a better understanding of the Technical Association and its relationship to the industry as a whole.

Service to Members

I have already mentioned the recommendations of the Service to Members Committee to the Executive Committee of certain definite subjects to follow for the year's work.

This committee should, in my opinion, be enlarged and be charged with the important task of studying and determining the problems which the Association should undertake.

In general two or more definite projects should be undertaken each year, preferably one along research lines and the other dealing directly with manufacturing practices. Arrangements should be made to carry these projects through to a conclusion, if possible.

In succeeding years, the committee in charge should have these old investigations in mind and while carrying on new work keep in touch with developments along the previously concluded projects.

This committee would be in an excellent position to establish close co-operation with the Bureau of Standards and Forest Products Laboratory.

To this end the Committee on Service to Members should serve as an advisory body for the work of all committees so that in so far as possible all activities of the association may be developed along definite lines determined by the Executive Committee.

An important field for this committee to develop is that of Standard Practices. If standards of practice could be worked out so that different mills could readily compare the efficiency of certain operations, a distinct advantage would be made. In the News Print Service Bureau, which comprises mills largely of similar character, this thing has been done very successfully, and is of distinct benefit to the mills receiving this service.

Co-operation with Other Organizations

The past year has witnessed a continuance of close co-operation with certain organizations and the formation of co-operative ties with others.

At the beginning of the year, the program of work was submitted to the American Paper and Pulp Association for suggestion and the hearty approval of the president and executive secretary received. The spirit of co-operation with the parent organization has been very fine throughout the year.

The joint committee on paper machine felts has continued its work with definite progress, and the felt manufacturers are most gracious in expressing appreciation of the support of our representatives and the industry at large.

The joint committee on Vocational Education has continued its work without interruption. I believe that the success that has marked this committee's endeavors should lead to the formation of other joint committees with our Canadian brethren as occasion arises.

Some of our members who are on the Advisory Committee to the Paper Section of the Bureau of Standards have rendered good service in helping to establish standards for use in paper specifications. This work is still under way.

At the request of manufacturers of Fourdrinier wires, a joint committee has been formed and is working on the problems which arise in the manufacture and use of wires.

Education

The report of the Committee on Vocational Education will show the present standing of our educational program.

This year has witnessed a fairly wide-spread use of the text books, considering their recent publication.

It would appear that our friends across the Canadian border are showing greater readiness to derive the benefits to be obtained than are our mills.

The fine financial support given the project by the Canadian Pulp and Paper Association is most commendable and deserving of our most humble and hearty thanks and appreciation.

The time has come, I believe, when consideration should be given to the question of apprenticeship. Are we training to the best of advantage, if at all, the young men entering our mills? How can the use of the text books best be tied in with the practical experience gained in the mills?

A study of this problem and a pooling of experience will without doubt be of much value. I commend to our Committee on Vocational Education acting jointly with the Educational Committee of the Technical Section of the Canadian Pulp and Paper Association a careful consideration of this question.

Finances

According to the new method of financing adopted at the Annual Meeting of the American Paper and Pulp Association last year, service organizations will have the moneys previously received from corporatons and mills collected by the parent association along with

its budget and then turned over to the service associations. Individual membership will remain as at present.

This means that the corporate memberships of our association will be abolished and the income derived from them will be obtained through the American Paper and Pulp Association.

As it is planned to have one payment by the company members of the American Paper and Pulp Association cover everything and thus obviate the necessity of special subscriptions, our Executive Committee should give careful consideration to the amount to be inserted in the budget of that association for the use of the Technical Association.

Chemical Exposition Meeting

During the Chemical Exposition held in New York City last September an informal meeting of the Technical Association was held in the Grand Central Palace at which were presented a number of papers dealing principally with mill equipment.

Heretofore it has been customary to include in the programs of our annual and fall meetings a certain number of such papers, presented usually by the manufacturer's agents, sometimes members of the Association and sometimes not.

Since confining our programs to certain definite projects and the results of committee work, there has been little or no place left for such papers.

Nevertheless, many of these papers contained information of much value to the industry.

An informal meeting during Chemical Exposition week appears to offer many advantages, therefore, but care must be taken to have all papers reviewed and approved by the Publications Committee before presentation, and manufacturers should be given to understand that such presentation does not give the stamp of approval of the Association to the machinery, apparatus, or method described.

Paper Industries Exposition

For many years there has been a demand on the part of the paper manufacturers, machinery builders, and others interested in a business way in the paper industry for an opportunity to exhibit their products to the public.

The Paper Industries Exposition which is now in session in the Grand Central Palace is the answer to this demand.

On Thursday afternoon we shall hold a session at the Exposition. Papers dealing largely with new methods and equipment will be read.

This plan provides a happy arrangement, as it permits papers to be presented which might not find a place in the regular program.

Conclusion

At the conclusion of two years' service as your president, I want to express my hearty appreciation of the fine spirit of co-operation which has been shown by the members of the Executive Committee, by the secretary, the committees, and the members at large when called upon to render service.

This period has not been one of easy progress and smooth going at all times. During the two years the industry has suffered the worst depression in its history. Time which formerly was gladly given to association work has been required for intensive work in the mills. Owing to reduction of forces those who remained have had additional work to do and less time for outside activities.

Money has been scarce, subscriptions have been reduced, or eliminated altogether. Many have found it difficult even to keep up the payment of dues.

The change in office of secretary last year entailed a large amount of work on the part of the Executive Committee, but fortunately the problem was very happily solved.

With the return of better business conditions in the industry this year, however, the work of the association is again becoming less arduous, members who dropped out are returning, and there is a greater readiness to co-operate and serve.

The coming year should, I believe, be the best thus far in the life of the Technical Association.

Beneficial and worth-while results have been obtained in the past. In fact I believe the Technical Association differs from many trade organizations in that it is a producer of results rather than remaning a social organization only.

But the future holds out still greater promises of service to the industry on account of the experience gained in the past. To attain the success which the future promises, however, each member and each committee must *work* when called upon to render service.

I bespeak for the incoming administration your continued hearty and enthusiastic support.

REPORT OF THE SECRETARY-TREASURER

Secretary W. G. MacNaughton presented his annual report as follows:

In the history of the association its progress in definite terms is to be measured by its accomplishments rather than by the size of its membership. Among the achievements particularly to be recorded are the following:

Methods of Testing Pulp for Strength, by the Sulphite Pulp Committee, 1916.

Methods of Testing Pulp for Moisture, by a special committee, 1919. Revised, 1921.

Paper Testing Methods, by the Paper Testing Committee, 1920. Revised, 1922.

Manufacture of Pulp and Paper, by a joint committee, 1921.

Investigation of Waste in the Industry, by a special committee, 1922.

Paper Drying, by a special committee, 1922.

A great many papers and reports have been presented that are valuable in themselves and some of them have had rather a wide distribution. An example is R. B. Wolf's "Creative Workman" which was published in 1919 as a separate and for which there is still an insistent call although it has long been out of print. Most of the material, however, is embalmed in the pages of the journals, however valuable it may be. A great improvement in this regard is the Technical Association Section of the PAPER TRADE JOURNAL which has been indexed by Clarence J. West and for which folders for separate binding are available.

Textbooks

The great outstanding work of the association to date, which when accomplished will be its permanent contribution to the industry, is the set of textbooks on the "Manufacture of Pulp and Paper." The third volume, which was issued in 1922, on the Preparation and Treatment of Wood Pulp, is an index of the high character of the work. It is reported that the fourth volume on the treatment of rags and waste paper with the preliminary steps to paper manufacture will be published about September, with the last volume about the beginning of next year.

Waste

During the year an undertaking of a different character, but no less valuable, was initiated. Investigation of Waste in the Pulp and Paper Industry and the work already done on it marks another distinct advance for the association. At its inception in 1915 the point of view as to manufacturing is expressed in the objects of the association, "that processes of manufacture may be made more efficient and improved along technical lines." From one of generalization or individual interest the attitude is developing into one of co-operative work along a definite line following a prepared plan.

Stimulated by the findings of the Federated American Engineering Societies' Committee on the Elimination of Waste in Industry, of which Herbert Hoover was chairman, at the last annual meeting a somewhat similar investigation was undertaken in the paper industry. The selection of Robert B. Wolf as chairman was particu-

larly fortunate, not only because of his eminence as an engineer but also because of his association with Mr. Hoover on the main waste committee.

To the vice-chairman, George D. Bearce, engineer of the News Print Service Bureau, with his close connection with this large and efficient group of mills, a great deal of the work so far accomplished is due. Associated with them are many of the most prominent engineers and manufacturing executives of the country. The enthusiastic co-operation given not only by the Bureau of Standards and Forest Products Laboratory, but more particularly by the chief executives of the paper mills, demonstrates clearly the wisdom of the undertaking.

The investigations carried on during the year on fiber loss in the mill effluent and the utilization of barking drum refuse as fuel are recognized to be of the broadest interest not only to manufacturers from the standpoint of economy, but also to the general public and the state and federal governments in their bearing on the problem of stream pollution. The interest of the pulp and paper companies in these investigations, as in measures for forest preservation, is a clear indication that they are advocates of tree conservation.

Paper Drying

The returns of a questionnaire handled by a special committee on Service to Members showed that the subject most insistently requiring study was drying paper and the factors governing its efficiency, and following the last annual meeting it also was undertaken.

In outlining the scope and laying the basis of the study the vice-president, Frederick C. Clark, had the chief responsibility, which was turned over to S. B. Jones as chairman of a special committee, at the fall meeting in Detroit last October after a progress report was presented.

The interest in the subject was there evidenced as well as at the convention of the Canadian Technical Section in January, where a paper on the subject was given by Slater and Warner of St. Maurice Paper Company, Three Rivers, Quebec.

The groundwork of the study in developing a paper drying code along definite engineering lines marks a distinct step serving as the basis of the future investigation.

Future Plans

As in the case of the committees on Paper Testing Methods and Vocational Education, it is recognized that those on Waste and Paper Drying have a task that will occupy their attention for several years and also the co-operating members and companies engaged in the study. The ultimate aim is to establish definite figures on which to base standards of practice.

In the study of waste, while the committee will cover special phases, it is intended that the regular standing committees for the manufacture of pulp will each direct their attention to the avenues of waste in the particular line of each process.

Standard Methods of Testing Materials

It has been urged on this committee that it collect the valuable work it has done in past years, including the methods of testing pulp for strength, color and moisture, and arrange the results for publication as in the case of Paper Testing Methods.

Vocational Education

This committee has a distinguished reputation to sustain. The textbooks are largely completed and correspondence courses along three avenues have been arranged. Resident collegiate courses on pulp and paper are in effect at the University of Maine and New York State College of Forestry at Syracuse, N. Y. During the present year it is expected that courses will be begun at Cornell University and plans are on foot to establish a provincial school of papermaking in Quebec.

In the case of the colleges it is provided that students should get employment in paper mills for the summer vacations to equip themselves in the practical side of their training. It is suggested that the Vocational Committee should interest itself in this as well as in the more particular problem of apprenticeship.

Membership

While no definite program has been undertaken for increasing the membership, it has been gratifying to see the additions to the list. This is particularly true of those who withdrew from the association for various reasons in the years past, and who have again become members.

This association is yours for the benefit of the industry. Its past has been a distinguished one as shown by its achievements: its present is full of promise but its future will be what its members make it. Many of those who were privates in the industrial ranks when they were first members are now commanding officers today. That they and their companies are most of them warm supporters today speaks well of the ideals of the founders of the organization and its adherence to them.

There are about 550 members today and it is safe to say that this number could readily be doubled by each of the present members engaging to secure one additional application. Those at least who should be members are the following:

Executives in charge of manufacturing.

Superintendents and assistant superintendents.

Plant engineers.

Those engaged in technical control laboratories and research.

It is suggested that those in attendance be urged to leave lists of prospective members at the registration desk.

The eminently practical character of the work under way and its value to the mills makes it reasonable and logical that they be given the opportunity to become corporate or sustaining members. The list of companies who are now corporate members includes, as can be recognized, many of the most progressive and successful concerns in the country:

American Writing Paper Company, George A. Galliver, president, Holyoke, Mass.

Brown Company, O. B. Brown, vice-president, Berlin, N. H.

Carew Manufacturing Company, L. M. Yoerg, South Hadley Falls, Mass.

Cliff Paper Company, A. A. Oatman, assistant treasurer, Niagara Falls, N. Y.

Crane & Co., R. O. Pierce, assistant manager, Dalton, Mass.

Dells Paper and Pulp Company, W. L. Davis, Jr., superintendent, Eau Claire, Wis.

Dill & Collins Company, Grellet Collins, president, Philadelphia, Pa.

Finch Pruyn & Co., Inc., W. W. Williamson, Glens Falls, N. Y.

Fletcher Paper Company, H. E. Fletcher, general manager, Alpena, Mich.

Hamersley Manufacturing Company, C. S. Hamersley, president, Garfield, N. Y.

Marathon Paper Mills Company, D. C. Everest, secretary, Rothschild, Wis.

Mead Pulp and Paper Company, Speed Warren, treasurer, Dayton, Ohio.

Miami Paper Company, A. H. Nevius, vice-president, West Carrollton, Ohio.

Nekoosa-Edwards Paper Company, L. M. Alexander, president, Port Edwards, Wis.

Northwest Paper Company, G. I. McNair, vice-president, Cloquet, Minn.

Orono Pulp and Paper Company, George E. Crafts, treasurer, Bangor, Me.

Oxford Paper Company, 200 Fifth avenue, New York, N. Y.

Port Huron Sulphite and Paper Company, E. W. Kiefer, president, Port Huron, Mich.

B. D. Rising Paper Company, Charles McKernon, president, Housatonic, Mass.

Schmidt & Ault Paper Company, John C. Schmidt, president, York, Pa.

Strathmore Paper Company, H. A. Moses, president, Mittineague, Mass.

Ticonderoga Pulp and Paper Company, Thomas E. Warren, vice-president, Ticonderoga, N. Y.

S. D. Warren Company, Samuel D. Warren, secretary, Boston, Mass.

Watab Paper Company, O. L. E. Weber, secretary, Sartell, Minn.

Wausau Sulphate Fibre Company, O. Bache-Wiig, vice-president, Mosinee, Wis.

West Virginia Pulp and Paper Company, David L. Luke, president, New York, N. Y.

Wolf River Paper and Fiber Company, W. E. Stoppenbach, manager, Shawano, Wis.

Those added to the list in the last few months are:

Consolidated Water Power and Paper Company, George P. Berkey, vice-president, Wisconsin Rapids, Wis.

International Paper Company, Philip T. Dodge, president, New York, N. Y.

Oswego Falls Corporation, H. L. Paddock, president, Fulton, N. Y.

Pejepscot Paper Company, Edgar Rickard, president, New York, N. Y.

Contact with Other Organizations

Besides the close co-operation with the Bureau of Standards, Forest Products Laboratory and Canadian Technical Section, other contacts have been:

American Pulp and Paper Mill Superintendents' Association.
American Railway Association.
American Society of Mechanical Engineers.
Cost Association of the Paper Industry.
Engineering Institute of Canada.
Felt Manufacturers' Council.
National Lime Association.
National Safety Council.
Wire Manufacturers' Council.

ELECTION OF OFFICERS

The election of officers of the Technical Association of the Pulp and Paper Industry resulted as follows: President, H. S. Taylor, Dayton, Ohio; vice-president, G. N. Collins, Jr., Philadelphia, Pa.; secretary-treasurer, W. G. McNaughton; to serve on Executive Committee, B. T. McBain, Port Edward, Ont.

BIG TIMBERLAND SALE IN MAINE

One of the largest timberland sales made by Maine owners for several years has just been transacted in the transfer of 57,000 acres of land on the St. Croix river from the James Murchie Lands Company to the Eastern Pulpwood Company. Most of the land is in Washington county.

These lands have been cut during recent years by the Eastern Pulpwood Company and the St. Croix Paper Company on stumpage rights. The Eastern Pulpwood Company has also made arrangements to purchase from the Murchie interests the land in Calais between the Ferry Point bridge and the railroad bridge and will occupy the Murchie office building.

L. T. DWYER PAPER CO. INCORPORATES

The Louis T. Dwyer Paper Company, Inc., 344 North Canal street, has incorporated in Illinois with capital stock placed at $20,000 to manufacture and deal in paper products and substitutes. The incorporators are F. J. Dwyer, J. C. Kropf and L. T. Dwyer. James K. Miller, 1147 Edison Building, is mentioned as correspondent.

ARE PRICES DUE FOR A RISE?

An interesting argument is advanced in *Investment Items*, a publication by the Royal Securities Corporation, Montreal, in support of a contention that pulp prices are due for an advance, as showing a far greater decline from the peak than current news print prices. Figures are given covering sulphite pulp and easy bleaching sulphite. The following comparison is made as between pre-war, peak, deflated and current prices:

	1914	1920	1922	1923
News print	$40	$130	$70	$75
Bl. sulphite pulp	55	220	80	95
Easy Bl. sulphite pulp	43	190	55	65
Sulphite pulp below high	...	...	...	61%
News print below high	...	...	...	42%

"Incidentally, it may be stated as a fact that sulphite pulp prices are about 18 per cent lower today than *Bradstreet's* index of staple commodities, compared with the 1917 index figures." After referring to the dumping of Scandinavian pulp on the United States market the past two years in liquidating large inventories, the article continues:

"In recent months, however, the situation has improved considerably. Canadian manufacturers of sulphite, pulp, such as Riordon, Fraser, Mattagami, and Whalen, have, through steady operation of their mills, effected great reduction, if not entire elimination, of high cost inventories; and imports of Scandinavian pulp have fallen off, due to liquidation of accumulated stocks and to increased demand by European countries.

"The result has been that prices have shown some slight improvement and prospects for more profitable operation of Canadian and United States mills are distinctly bright. An additional factor bearing on the situation is the extensive lockout which has been in effect in Sweden since the end of January, owing to a wage dispute between the mill owners and employees. This lockout affects 35 mills making sulphite and 16 soda pulp mills, as well as 25 ground wood pulp mills, and involves 15,000 employees. The effect of this stoppage on the American pulp market will no doubt be felt extensively during the next twelve months. It is estimated by authorities in close touch with the industry that the net loss to the market to date (March 15) amounts to approximately 13,000 tons bleached sulphite, 125,000 tons unbleached, 45,000 tons sulphate (kraft) pulp, and 300,000 tons mechanical (ground wood) pulp—a total falling off in supply of about half a million tons.

"This serious curtailment of available supplies from Europe must result in a more favorable market for domestic pulp. It seems quite logical to anticipate that the disparity in prices as between news print and sulphite pulp (which is largely used in the manufacture of most grades of paper and has a much wider market than news print), will be adjusted by an increase in price of the latter, which will bring proportionately higher revenue to manufacturers."

NORTHWEST SUPERINTENDENTS TO MEET

The Northwestern Division of the American Pulp and Paper Mill Superintendents' Association will meet May 11 and 12 at Wisconsin Rapids, Wis. L. E. Snull, the chairman of the committee of arrangements will send out the official notices soon, but in the meantime it may be said that the meeting will be decidedly worth while and that it will be a wise precaution to reserve hotel rooms at Wisconsin Rapids as much in advance of the meeting as possible. There will be an opportunity to visit seven or eight of the best mills in the Wisconsin River Valley, making all grades of paper and there will be many other attractive features.

ESTATE OF LATE F. G. CRANE

The estate of the late Frederick G. Crane, head of the Crane paper mill interests totalled $3,140,000 according to the bond filed at Pittsfield, Mass., last week. Of this the personal property was valued at $2,900,000 and the real estate at $240,000. The will which has been allowed bequeathed all of the property to the family, the widow, Mrs. Rose P. Crane being appointed Executrix.

TAPPI Papers and Reports

Presented at the Annual Convention of the Technical Association of the Pulp and Paper Industry at the Waldorf-Astoria, New York, April 9-13, 1923—Representative Men of the Industry Discuss Various Important Problems of Timely Interest

Report of the Committee on Waste

By R. B. Wolf, Chairman, and G. D. Bearce, Vice-Chairman

The study of waste in the pulp and paper industry covers a broad field and in view of this fact the specific investigations of the committee outlined in this report were confined to the three following major subjects:

1. White Water Losses and Their Reduction.
2. The Utilization of Bark and Wood Refuse.
3. The Reduction of Broke Losses.

These subjects show material losses that can be prevented or materially reduced by the adoption of proper equipment and standard methods of procedure.

A large number of tests were conducted by pulp and paper mills independently and several specific tests covering the major problems were carried on by mills in co-operation with the committee and governmental bureaus. The results of the tests and the detailed information are given in the supplementary reports of the Waste Committee.

The results of a general investigation are also included and the other losses occurring in the pulp and paper industry are outlined with particular mention of specific items. This shows the possible scope of investigative work and indicates some of the problems that should receive future consideration.

1.—White Water Losses and Their Reduction

The survey of this problem indicates with a few exceptions that this source of waste has not been seriously considered until recently. The general viewpoint of many operators has been that the effluent going away from the mill is a necessary evil and does not contain material of recoverable value. This idea still persists in many mills. Moreover, the waste water goes away from the mill under the buildings or in some other place that creates a hidden condition that is seldom investigated in a great many plants.

The first obvious fact in this study is that a majority of mills use too much water. This adds to the cost of filtering and furnishing fresh water and increases the material losses because an excessive volume of water the common carrier, goes down the sewer. Several mills have materially reduced their fresh water requirements and consequently their fiber losses by more extensive use of white water on the machine in the beater room and in other departments. The volumetric flow diagrams shown in the supplementary report and closely followed in actual practice indicate the possibilities of white water utilization. The sedimentation tank system provides an effective means of re-using water in the paper mill as indicated in the tests. As a practical example of the effective use of return water one mill reduced its fresh water requirements nearly 20 per cent. A number of plants use from 10,000 to 12,000 gallons per ton of product per day in the paper mill alone with satisfactory results, while others use as high as 25,000 gallons. In a few isolated cases the maximum and minimum water consumption varies from approximately 6,000 gallons to over 40,000 gallons per ton of product.

The fiber loss per 1,000 gallons of white water going to the sewer is of course influenced by the volume of water per ton of paper. Under good operating conditions this should not exceed an attainable standard of 0.5 of a pound per 1,000 gallons and in the manufacture of some grades of paper should be even less.

The amount of material lost per ton of product in the white water showed a variation of from 1 to 12 per cent in different mills. Some variation is expected between wrapping and kraft mills which use a large amount of long fiber stock and book and similar mills which use finer material and filler. Figures indicate that the average fiber loss per ton of paper should be 1 per cent or less in kraft, sulphite, fiber board and other long fiber grades, and 1½ per cent or less in book, news and other grades making paper from short fiber stock.

The use of screen savealls to reclaim the stock in white water has been adopted by a large majority of mills. The effectiveness of the saveall is largely dependent upon its mechanical condition. On grades of paper taking a medium or long fiber pulp, a modern and well operated machine of the revolving cylinder type should reclaim 75 per cent or more of the stock delivered to the saveall. The sedimentation tank is especially adapted to the reclamation of short fiber stock and filler. One complete test of a settling tank system used in a book and bond mill showed a 95 per cent efficiency of material reclamation and a clay and fiber loss of only 0.57 pound per 1,000 gallons of waste water.

The production of all grades of paper in the United States for the year 1922 was practically 7,000,000 tons. Every *one per cent* saving means the conservation of 70,000 tons of material which at an average figure of $30 per ton represents a saving of over $2,000,000. A conservative estimate indicates that an average reduction of 5 per cent of the waste water losses is possible.

The question of mill effluent is closely allied to the stream pollution problem which is becoming increasingly important. Legislative action is being strongly advocated in many sections and in some instances stream pollution laws have been passed and are rigidly enforced. More complete utilization of white water will do much to prevent stream contamination and tend to minimize the importance of the stream pollution problem.

2.—The Utilization of Bark and Wood Refuse

The problem of using or otherwise disposing of bark from drums and wood room refuse confronts nearly every mill that makes its own pulp. The results of a survey of the problem were given in

the Progress Report of the Waste Committee at the Detroit meeting, October 9, 1922, and the discussion of the subject brought out many valuable and interesting facts.

Practically all of the mills utilize their bark as fuel, although several find it cheaper to run it to the river. Some attempts have been made to convert bark into a cheap grade of paper but the assembly and conversion costs make it impracticable on a commercial scale at the present time.

About half of the mills using bark and refuse burn it alone and the remainder in combination with coal. The results obtained in a majority of cases indicate an inefficient use of the actual fuel value in the bark and refuse. To a large extent this is due to the moisture in the bark from the drums and to the design of the furnace. Consequently bark pressing equipment and furnace design were studied in connection with this problem.

Bark Pressing Equipment

The heating value of dry spruce and balsam bark as determined from calorimeter tests ranges from approximately 8,200 to 9,400 B.t.u. per pound, and a conservative figure of 8,220 B.t.u. was established in computing the heating value of material of different moisture content. The moisture in unpressed bark from drums is 75 per cent more and has a heating value of about 1,200 B.t.u. as fired. If the bark is reduced to 50 per cent moisture the heating value increases to approximately 3,600 B.t.u. per pound as fired as shown on the curve of "Available Heating Values" in the supplementary report.

Several mill tests made on two types of bark presses indicate that it is entirely feasible and economical to reduce the moisture in bark to about 50 per cent moisture. The operating cost of a bark press including power, repairs, etc., is estimated at about $2 to $2.50 per day per 100 cords of wood barked assuming that the operation of the press is automatic and does not require a special attendant. This gives a cost of 2 cents to 2½ cents per cord or about $0.20 per ton of dry bark pressed. The value per ton of dry bark based on $7 coal of average B.t.u. is equivalent to $2 per ton of dry bark compared to $0.70 for unpressed bark, thus showing an appreciable saving by the use of a bark press.

Furnace Design

The problem of effectively burning bark and waste is no less important than the proper preparation of the material. The two methods of burning the refuse each have their advantages and are adapted to the different conditions encountered. When refuse is burned alone the dutch oven type of furnace is commonly used. Recent developments in the design of refuse furnaces outlined in the detailed report make possible higher efficiencies. Special attention has been paid to methods of feeding bark to the furnace and the concentration of heat in the combustion zone by means of refractory walls.

The dutch oven type of furnace is satisfactory when a continuous supply of refuse is available. Mills that have an intermittent supply of bark, as pointed out in the detailed report on the subject, have found it more satisfactory to combine the dutch oven with an underfeed stoker for coal. This gives greater flexibility as the change from coal to refuse is easily made so that the entire boiler room equipment is in use at all times. Moreover, the coal and refuse may be effectively burned in any proportion depending upon supply of bark from the wood room.

In general the chief points to be considered in the economical utilization of bark are:

1. The bark should be reduced to approximately 50 per cent bone dry and fed to the furnace with some degree of regularity.
2. The design of the furnace should provide for sufficient grate surface to give correct combustion and refractory walls to help evaporate moisture.
3. Correct draft conditions for most efficient combustion should be determined and maintained.

Approximately 4,500 tons of *dry* bark would be produced per year in a mill with a daily consumption of 100 cords of rough wood. Assuming average heating values for coal and bark (50 per cent dry) and coal at $7 per ton, complete bark utilization indicates a possible fuel saving that is equivalent to a reduction of over $8,000 annually in the cost of coal.

3.—The Reduction of Broke Losses

The question of broke is one that is continuously before nearly all paper mills. News print mills with their high speed machines and book and writing mills with their supercalendering, cutting and rewinding operations have the greatest percentage of broke. This problem in wrapping, kraft mills and specialty mills is less acute and in mills making tissue, board, building and similar papers the percentage of broke loss is smallest.

Many news print mills use effective control methods to reduce their broke to a minimum. Stock control by means of freeness and other tests in the groundwood mill has been adopted so that pulp of uniform characteristics will be delivered to the paper machine wire. The regulation of consistency is extensively used to get the correct proportions of groundwood and sulphite and also to help control the concentration of stock to the machine. The mechanical handling of the sheet on the machine by means of compressed air and with rope carriers on the dryers has also been a factor in reducing broke as well as the use of improved reels.

The character of stock in book mills and its action on the machine has been studied by some operators. The consistency regulator is also used to control the density of slush pulp so that the volumetric measurement will give the proper proportions of different stocks in the furnish. Standard methods of beating and jordaning have also been adopted by some mills.

The mechanical condition of the paper machine is no less important than the stock and many mills give this question a great deal of attention. The operating and engineering departments of several plants make a complete inspection of their machines every four to six months in order to keep them in good operating condition. Special attention is given to the alignment of all parts of the machine, carrying rolls are put in round and leveled and standard crown on press and calender rolls are maintained.

In order to keep a close check on operating conditions, standard methods of computing paper machine efficiencies that record and analyze the broke losses, time down and other operating information have been adopted by many news mills. Nearly all mills keep a record of broke losses and in many book and writing mills the percentage of loss in each department is analyzed. Records of this nature are used to stimulate the interest of the operating departments in the reduction of losses by keeping the progressive facts before the operating crews and with this idea in view a standard method of compiling operating reports has been suggested and outlined in the supplementary report on this subject.

Another method that is effectively used to bring the broke losses to the attention of the workers and managements is to convert the broke and time losses to dollars and cents. The broke lossess may be used with the cost statements as a subsidiary record, or, as is being done by one company, incorporated in the cost figures. The plan of placing cost figures of some kind before the operating departments is an effective instrument that greatly emphasizes the money lost on account of broke.

The important points in the problem of broke are:

1. The most important factor is good papermaking.
2. Correct stock percentages as well as freeness and consistency control is essential.
3. The machine should be kept in good mechanical condition throughout.
4. Complete operating and cost records are an effective instrument in emphasizing the losses due to broke and the necessity for their reduction.

General Investigation

A large amount of general information has been collected upon the other phases of waste that are more or less prevalent in the pulp and paper industry.

The following outline of the various manufacturing processes indicates the principal items in addition to those already discussed that should receive consideration in the effort to eliminate or materially reduce waste in the manufacture of pulp and paper.

1. Wood Preparation.
   (a) Reduction of losses in barking and cleaning wood.
   (b) Uniformity in production of chips.
   (c) Reduction of sawdust loss.

   The fiber loss from sawdust is an actual material loss. Tests indicate that the average loss of approximately 4 per cent can be reduced to 1 per cent by means of efficient equipment and proper attention to the mechanical condition of the chipper.
2. Groundwood Mill.
   (a) More complete utilization of white water.
   (b) Proper grinder regulation.
   (c) Reclamation of slivers and screenings.

   Appreciable savings are being made by the refining of screenings and several mills utilize the slivers from the bull screen by regrinding them in a special pocket.
3. Sulphite Mill.
   (a) Efficient use of sulphur and control of SO_2 gas.
   (b) More effective lime and limestone utilization.
   (c) More adequate cooling and recovery systems.
   (d) The utilization of waste liquor.
   (e) Economy of steam consumption.
   (f) Reduction of heat loss by the use of digester insulation.

   An asbestos mat digester covering has recently been adapted to sulphite mills that is approved by the insurance underwriters. Considerable savings will be made by the use of this type of insulation on digesters.
4. Sulphate Mill.
   (a) More effective chemical recovery and the economical use of materials.
   (b) Reduction of heat losses and economy in the use of steam.
   (c) Utilization of lime slude and turpentine.
5. Soda Mill.
   (a) Effective utilization and reclamation of chemicals.
   (b) Heat recovery from rotary burners.
   (c) Utilization of lime sludge.
6. Old Paper Plant.
   (a) Reduction of sorting and dusting loss.
   (b) Reducing the material shrinkage in cooking and washing.
7. Rag Mill.
   (a) Reduction of sorting and dusting loss.
   (b) Reduction of shrinkage of materials in cooking, washing and bleaching processes.
8. Paper Mill.
   (a) Effective consistency control and volumetric measurement of stock.
   (b) Efficient use of wires and machine clothing.
   (c) Reduction of steam consumption in the drying of paper.
   (d) Reduction of heat losses due to radiation.

   One of the greatest preventable wastes in the paper industry is the lost heat from the drying system discharged through the roof of the machine room. Effective equipment is available that will reclaim a large percentage of this heat.
9. Steam Plant.
   (a) Economical feedwater temperatures and the use of treated water and condensate.
   (b) The reduction of dry chimney gas losses—economizers and air preheaters.
   (c) Reduction of radiation losses from boiler and furnace walls.
   (d) Reduction of combustible in ash.
   (e) Prevention of scale and soot.
   (f) Efficient stokers and other equipment.

   The average steam plant utilizes about 60 per cent of the heat in the coal. Effective control of operating methods by the use of the proper measuring and recording instruments makes possible an overall efficiency of 75 to 80 per cent. The reduction of boiler plant losses is one of the most important problems in the paper industry.

   The use of powdered coal in new and reconstructed boiler houses and the installation of oil equipment in new plants gives higher efficiencies and materially assists in reducing the cost of generating steam.
10. Bleach Plant.
    (a) Reduced chemical loss—bleach powder vs. liquid chlorine.
    (b) Reduction of fiber shrinkage and washing loss.
    (c) Use of electrolytic bleach.
11. Handling Materials.
    (a) The use of more economical wood and pulp conveyor systems.
    (b) Efficient handling and storage of coal, sulphur, lime, old papers, etc.
    (c) Improved storage facilities and handling methods for finished paper.
12. Power Transmission Losses.
    (a) Reduction of line shaft and belting losses.
    (b) The adoption of more efficient water, stock and suction pumps.
    (c) The reduction of motor, generator, and waterwheel power losses.
13. Wood and Pulp Storage.
    (a) Reduction of fire hazards in wood storage by the use of sprinkler systems.
    (b) Reducing pulpwood decay and the deterioration of mechanical and chemical pulp.
14. Management.
    (a) The adoption of effective cost keeping methods and operating records.
    (b) The consideration of employee representation and wage adjustment methods.
    (c) The development of insurance plans, pensions and medical treatment.
    (d) The supervision of safety education and vocational training.

In the final analysis all losses due to wasteful methods and inadequate equipment can be eliminated by efficient management. The operators, engineers, chemists and other trained men may develop new processes, perfect improved designs, evolve effective control methods and achieve other specific attainments and their adoption and utilization is largely dependent upon the good judgment of progressive management. Every new idea should be fully evaluated and all practical methods of waste utilization given complete consideration.

In the report on the "Elimination of Waste in Industry" made by the Federated Engineering Societies' Committee, of which Hon. Herbert Hoover was chairman, the problem is clearly outlind in the following statement:

"The investigation clearly indicates that industrial waste is caused not only by failure to use the time and energy of living man but also from failure to use the productive equipment which has resulted from the time and energy expended by past generations. In the effort to eliminate waste of human energy it is recognized that more must be accomplished in the same time or the same must be accomplished in less time, and to this end the vast heritage of recorded knowledge of past experiences must be made available to an ever increasing number of men."

White Water Losses and Their Reduction

Supplementary Report of the Sub-Committee on Waste

By H. F. Obermans, Chairman; F. R. Hyatt; J. E. Plumstead

At the fall meeting of the Technical Association in Detroit a large part of the time was devoted to meetings of the "Committee on Waste in the Industry." The various sources of waste in paper and pulp mills was thoroughly discussed and the conclusion was reached that it seemed advisable to form sub-committees each dealing with one particular phase of the waste problem. The undersigned sub-committee was appointed to analyze and investigate paper and pulp mill waste through the mill effluents.

A survey of the industry was made in co-operation with the Forest Products Laboratory to ascertain in general the extent of these losses as well as the equipment used to reclaim stock. A large number of independent tests were conducted by various mills and two specific investigations were made in co-operation with the Paper Section of the Bureau of Standards at the mills of Dill & Collins and the Miami Paper Company.

Approximately 400 questionnaires (Exhibit A) were sent to a great many mills to which 64 replies were received. With very few exceptions, however, the information obtained in these questionnaires was very inadequate and little tangible data can be obtained from them. The only definite piece of information brought out and that very forcibly, was that most paper mills are in a happy state of ignorance as to the amount of fiber or other losses through their mill effluents.

Analysis of Questionnaires

A summary made up from these questionnaires is shown in Table 1.

Of these 64 mills, only 10 report any fiber losses and but 9 give any specific report on recovery. Thirty-three of the mills use savealls while entirely too few mills are represented in order to enable us to draw definite conclusions; the figures show that the tissue mills experience the greatest losses (maximum, 220 pounds per ton of product). Only 26 of the 64 mills gave definite answers as to the quantity of white water going to sewer per day and these figures in many instances are only estimates, as brought out by answers to question No. 4 inquiring into the method employed for measuring white water.

An analysis of the questionnaire and the answers received thereto brings out the thought that it is necessary to supply the operators with information which will enable them to calculate their losses on a standard basis. This should include the following items:

TABLE 1

	Total	News	Book	Tissue	Board	Bond	Specialties	Kraft
No. Mills reporting.....	64	8	6	11	22	13	3	1
No. Mills reporting loss and recovery	11	4	0	4	1	2	0	0
No. Mills reporting loss only	10	2	3	2	1	2	0	0
No. Mills reporting recovery only	9	1	1	0	6	1	0	0
No. Mills reporting neither	34	1	2	5	14	8	3	1
No. Mills using Savealls.	33	6	4	6	10	5	2	0
No. Mills not using savealls	31	2	2	5	12	8	1	1
Fiber lost per ton product								
Maximum	..	140	103	220	100	170	..	..
Minimum	..	16	15	3	20	9	..	..
Average	..	73	31	52	25	63	..	..
Fiber recovered per ton product—Maximum ...	..	40	135	91	50	39	..	..
Minimum	..	3	135	5	8	9	..	..
Average	..	27	135	18	27	24	..	..

TABLE 1-A

Types of Saveall Used

Type of Saveall	*No. of Mills Using Saveall*
Bird	4
Moore & White	2
Powers Cone	1
North	10
Angle	1
Improved Paper Machinery	4
Decker Machine	2
Squirrel cage	1
Fullner	1
Cylinder type	2
Noble & Wood	1
Own type and design	6
Pusey & Jones cone	3

1. Standard methods for calculating quantity of effluent.
   (a) Wier.
   (b) Measuring tanks.
2. Standard methods for sampling water.
   (a) Manual.
   (b) Automatic—*i. e.*, water wheel or revolving arm samplers.
3. Standard methods for determining fiber and ash, as well as microscopical analysis.

Savealls

The fibrous material used in the manufacture of paper or pulp is of so much value that energetic steps should be taken to reclaim it from the mill effluents. In large mills, however, and particularly in paper mills which are operated in conjunction with other processes, such as sulphite and soda mills, the mill effluents carry usually beside the fibrous material numerous other substances, which if mixed with the fiber very materially depreciate the value of the material saved. It is thus of particular interest to reclaim the fibers at the source, that is, for instance, directly on the paper machine, so that the material saved may again and immediately be returned to the beaters or the paper machine from whence it came. This loss is influenced by the character of pulp used in the paper, although the effort of the mill to reclaim stock is the most important factor.

Savealls may be divided into two principal classes: First, those which reclaim and save fibrous material from the mill effluents and convert it into such a shape as to make it immediately suitable to enter the manufacturing process, and, second, those which save and convert the fibrous material into such a shape that it can be conveniently handled and stored. This latter type is particularly adapted to a mill making specialties or colors while the first type is preferably used in plants making long runs of one kind of paper.

Then again, the nature of the product of a paper mill has an important bearing on the selection of the proper type of saveall. News or book mills particularly will select types of savealls from which the stock saved can be again directly added to the process. Book mills are interested in saving a large quantity of the filler used. The settling tank method furnishes the most ideal installation in large mills where greater production and large quantities of waste water necessitate enormous settling capacity.

On the other hand, a specialty mill making small runs of numerous colors will naturally prefer a saveall which converts the stock into dry shape, in which form it can be conveniently handled and stored.

The principal reasons why savealls should be used in pulp and paper mills are:

1. To recover and save fiber.

2. To prevent stream pollution.
3. To afford check on manufacturing operation.

The value of a saveall, particularly from the latter standpoint, must not be under-estimated. In pulp mills particularly, numerous opportunities exist where stock can go to waste through leaky collars, pulp thickeners, broken screens, et cetera, which would be entirely undetected unless the effluent or waste from these machines is passed through a saveall.

The maximum allowable losses based on paper or pulp production should be approximately as follows:

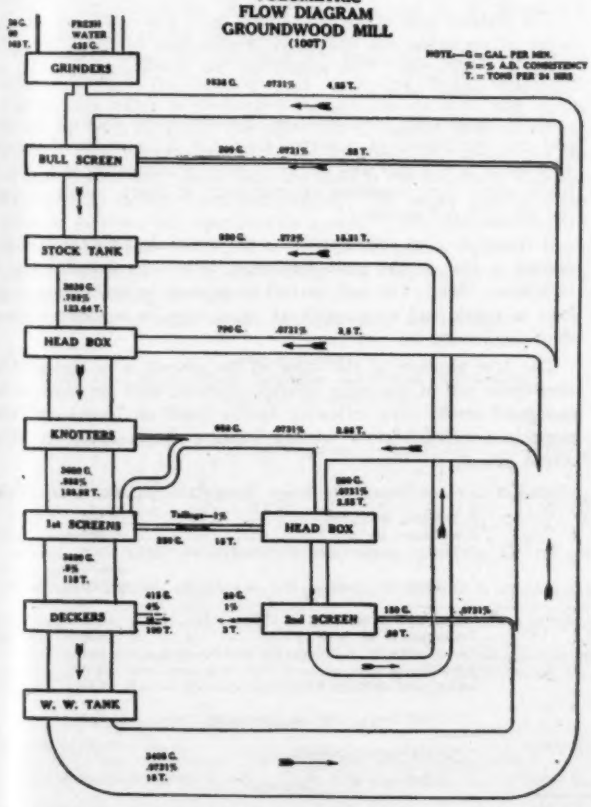
(1) All long fiber stock ½ of 1 per cent.
(2) Mixed long and short fiber 1 per cent.
(3) Largely short stock 1½ per cent.

The first class includes kraft, sulphate, et cetera; the second, book, bond, et cetera, and the third, news, chip, board and low-grade specialties. This minimum is possible and attainable by: (1) More complete utilization of white water. (2) The use of efficient savealls.

The Re-Use of White Water

Water is used so extensively in pulp and paper mills as a common carrier for stock that it receives little attention. A complete analysis of water consumption usually discloses its excess use and indicates methods of economy. The fact that a 1-inch pipe under

Fig. 1
VOLUMETRIC FLOW DIAGRAM
GROUNDWOOD MILL
(100T)



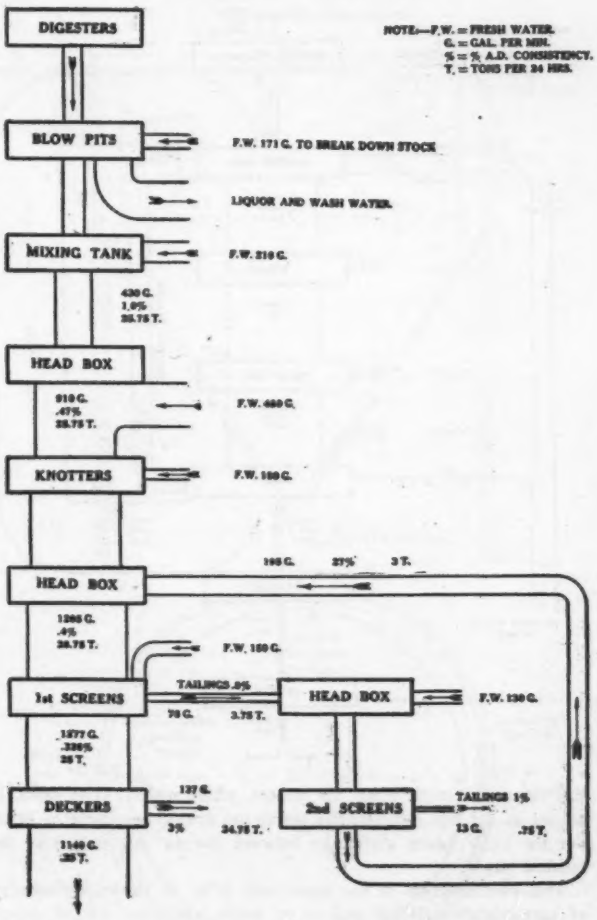
40 pounds pressure will discharge nearly 350,000 gallons of water per day illustrates how easy water is wasted.

The problem of fresh and waste water utilization involves close regulation of stock consistencies and water volumes throughout the processes. The volumetric flow diagrams (Fig. 1, 2 and 3) for the ground wood, sulphite and paper mills, respectively, show how the white water can be controlled and used.

These diagrams are made for a 100-ton ground wood mill, a 25-ton sulphite mill and the two combined to make a news print mill.

A ground wood mill will operate under a balanced condition by eliminating fresh water showers from press and decker molds and returning the white water to the system as shown in the diagram.

Fig. 2
VOLUMETRIC FLOW DIAGRAM
SULPHITE MILL
(25T)



Where presses and deckers are operated without showers on the wires, it may be necessary to clean them once or twice per day with a high pressure hot water hose, but the expense involved is more than offset by the saving in stock accomplished.

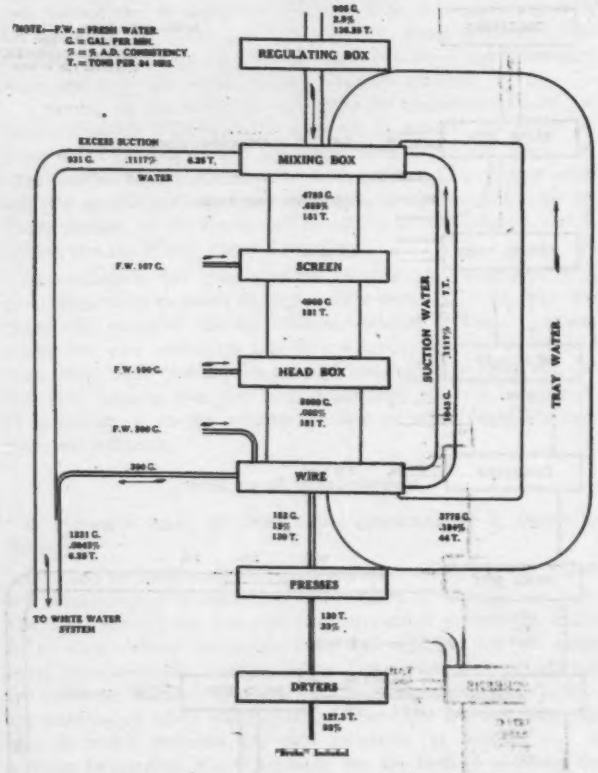
On sulphite a good type of decker or press with proper care will remove practically 99 per cent of the supply. Under these conditions better results are usually obtained by not using too much of the sulphite white water back in the system. It is, though, a good plan to pass this water through a saveall if for no other reason than to serve as a tell-tale to show up a leak in a deckle strap or a break in a wire long before it would be discovered otherwise.

A sulphite mill system serves as a good outlet for excess paper mill white water. In the case of the 25-ton system shown, 500 to 600 gallons per minute of the paper mill water carrying approximately 3 tons of stock per day, could be used to advantage. Under this condition the loss from the sulphite mill will be greater but

still about 80 per cent of the stock in the paper mill water will be retained with the sulphite stock.

The paper mill system is drawn for machines having trays and is shown with tray and suction water supplied to a mixing box having baffles so arranged that all the tray water is used before any of the suction water. The supply to the machine includes the ground wood and sulphite production, the worked up broke and

Fig. 3
VOLUMETRIC FLOW DIAGRAM PAPER MILL (120 T)



the recovered stock from the excess white water. The stock is shown as air dry consistencies up to the driers, purposely to bring out the book figure shrinkage between the air dry pulp and the finished paper.

This flow diagram of the paper mill (Fig. 3) shows a discharge of approximately 14,000 gallons of white water per ton of paper. In some mills it would be possible to reduce this to about 11,000 gallons per ton by further re-use of white water on screen and head box showers. Self-cleaning and cleanable shower pipes are being used with considerable success by a number of mills and in that way the fiber is saved at the source. A board mill recently adopted this type of shower and as a result cut down its fresh water requirements about 15 per cent.

The Use of Savealls

There are three different types of savealls: (1) Inclined screen, (2) revolving cylinder, (3) sedimentation tanks, and though they all reclaim stocks, each has its special field.

The Inclined Screen Saveall

This general utility saveall is the most economical to operate and especially adopted to long fiber stock. A saveall of this type is usually made by the mill mechanics. It has an angle of 50 to 60 degrees, is approximately 12 feet high, wide enough to meet the screening requirements and is covered with a 65 to 75 mesh old fourdrinier wire. It is less effective on medium fiber and short stock and tests show an efficiency of about 40 per cent.

The Revolving Screen Saveall

This type of stock reclaiming equipment is the one largely used in pulp and paper mills and needs no description. In general, savealls of this type that are well operated and kept in good mechanical condition should reclaim approximately three-fourths of the stock going to the saveall, or, in other words, attain an efficiency of 65 per cent to 75 per cent. There are a number of makes on the market and several of them have special features of design that tend to give more efficient results or decrease the operating cost. The Bird saveall operates intermittently, resulting in better felting of fiber on the wire and works well on varying loads. The North saveall is an outward flow machine and in addition to its stock reclaiming ability can deliver the reclaimed material at high or low consistencies. Several machines such as the Improved saveall use a suction-blower arrangement to remove the stock from the cylinder, thus eliminating the scraper or upper roll. The Woods machine and others have special features. The Oliver Filter is equipped with a special wire and suction that gives a very high operating efficiency in stock reclamation. This machine is used successfully to wash pulp and in similar material.

Fullner Saveall

The Fullner type of saveall is used by a few mills, but the expense of operation and upkeep is greater than for other kinds of savealls, consequently the return on the investment is small on ordinary grades of stock.

Tests on savealls have been accumulated from different sources and are reproduced as reported from the mills in the Appendix (Tables 2, 3, 4, 5, 6, 7 and 8). The varying conditions of grade of stock, water flow, condition of equipment, et cetera, partly account for the different results.

It cannot be over-emphasized that the mechanical condition of any saveall is one of the most important factors in its efficiency of reclaiming fiber. The best saveall made may be ineffective if not kept in repair and as a result all types may be condemned when they should not be.

The true measure of the value of the saveall is to compare the investment cost of operating, upkeep, et cetera, with the value of the recovered stock. The following figures based on liberal cost estimates and average stock savings indicate the economy of using screen savealls:

Estimated Cost and Saving with Screen Saveall 100-Ton Mill (2 Machines)

2 Savealls @ $1,750	$3,500
Installation costs	400
2 Two-hp. motors and equipment	100
Total	$4,000
Interest on investment @ 7%	$280
Depreciation @ 10%	400
Power required 4 hp. @ $36 per hp. yr.	144
Repairs	100
Labor (one man ½ time)*	400
Total annual cost of reclaiming stock	$1,324

*Not always necessary.

Savings

Stock Reclaimed Per Day, lb.	Percentage Reclaimed Stock to Production	Value of Reclaimed Stock Per Ton	Gross Yearly Value of Stock Reclaimed	Net Saving Per Year
1,000	0.5	$50	$7,500	$6,176
		25	3,750	2,426
2,000	1	50	15,000	13,676
		25	7,500	6,176
4,000	2	50	30,000	28,676
		25	15,000	13,676

The smallest figure of stock reclamation represents an estimated saving of only 500 pounds per machine per day and on average stock should be attainable by the most ordinary saveall. The net saving for this condition at the lowest value per ton indicates that the investment will pay for itself in less than two years.

Sedimentation Tank Savealls

Considerable attention recently has been given to the use of continuous flow selling tank as a means to reclaim fiber and filler. There are several makes on the market, including the Pusey-Jones and the Booth systems, and a number of mills have constructed their own tanks from concrete or wood.

Several mills use the intermittent settling system with good results, although this type requires more attention and consequently has a higher operating cost.

In order to obtain some new data on the effectiveness of the settling tank system two mill tests were conducted through the courtesy of the Dill & Collins and Miami Paper Companies. The Bureau of Standard and Waste Committee co-operated in obtaining the data at these mills. The runs were made on offset and bond papers using similar grades and quantities of pulp and clay.

Dill & Collins Test

The test at the Dill & Collins mill was run on No. 3 machine making offset paper February 16, 1923. J. R. Kessler and other members of the company assisted in the work, which was directed by G. D. Bearce, of the Waste Committee, and M. B. Shaw and G. W. Bicking, of the Bureau of Standards.

The water from the wire and pit under the couch goes to a concrete tank in the basement and is re-used in the usual way. The surplus water is discharged through an overflow pipe to the sewer, as well as all of the other water coming away from the machine. No. 3 machine makes various grades and colors and has no saveall equipment other than the tank in the basement, although some settling action takes place there. The water coming away from the machine was measured by a wier. Later measurements of the overflow water established a basis of computing the total water going to the sewer. The white water was sampled for consistency at intervals during the test.

The following table shows the summary of results:

Dill & Collins
Test Made by the Waste Committee and Bureau of Standards
February 16, 1923

Flow of	Cubic ft. per min.	Gallons per hr.	Lb. Per 1,000 Gal. Fiber	Lb. Per 1,000 Gal. Filler	Lb. Per 1,000 Gal. Total	Lb. Loss Per Hour Fiber	Lb. Loss Per Hour Filler	Lb. Loss Per Hour Total	Calculated Lb. Loss Per Day Fiber	Calculated Lb. Loss Per Day Filler	Calculated Lb. Loss Per Day Total
White water from machine	3.826	1,668.8	5.24	5.34	10.58	8.755	8.91	17.66	210	214	424
White water from overflow	*9.97	4,463.0	3.00	3.48	6.48	13.39	15.53	28.92	321	373	694
Total		6,132				22.14	24.44	46.58	531	587	1118

*A subsequent test showed an average flow of water from the machine of 7.815 cu. ft. per min. and from both machine and overflow 28.178 cu. ft. per min. A ratio of flow of 2.6 was established from these figures.

Stock Balance of Test

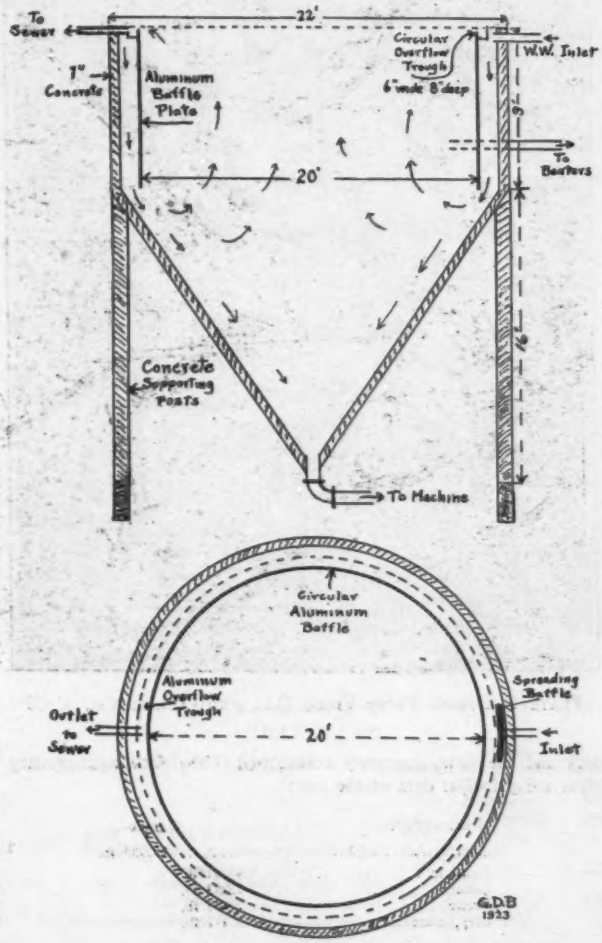
Furnish to beaters (b. d.)	6,465 lb.
Sul., 46%; soda, 10%; ledger, 19%; broke, 8%; clay, size, etc., 17%.	
Paper made (b.d.; 4,898 lb. rolls; 772 lb. trim and broke	5,670 lb.
	724 lb.
Shrinkage (Est. difference between input and output)	795 lb.
Shrinkage (based on white water)	252 lb.
Loss, based on paper made	4.44%
Fibre and filler loss based on paper made:	
Gallons of water per day	147,168
Gallons of water per ton of paper	11,680

The average depth of water going over the weir was 0.956 inches. Considerable difficulty was experienced in measuring the depth of water going over the crest. The gallons of water per ton of paper is very low and it is possible that this figure is not high enough.

Miami Paper Company Test

The second test was conducted at the Miami Paper Company, West Carrollton, Ohio, February 27, 1923. The Bureau of Standards was represented by M. B. Shaw and G. W. Bicking and the Waste Committee by G. D. Bearce, vice-chairman. Very effective assistance was given by O. P. Gephart, chemist of the Miami Paper Company, and other members of the organization.

FIG. 4
DIAGRAMATIC SKETCH
SEDIMENTATION TANK
Approximate Dimensions



Sedimentation Tanks

These are of concrete construction about 20 feet in diameter and 24 feet high from the bottom of the cone. The general layout and piping arrangement is shown in Fig. 4. The inner tank and circular overflow pans are aluminum. The tanks are all housed and one tank of a capacity of 35,000 gallons serves each paper machine.

A 7¼ hour test was made on No. 4 machine, making color plate paper, and white water measurements covered a period of 6 hours. All the white water going away from the machine went to the settling tank and a constant supply of the con-

centrated material from the bottom of the tank went back to the paper machine. Water for the beaters was drawn off through the supply pipe half way up the tank. The total amount of white water discharged by the settling tank was measured in concrete

PLATE 1—OFFSET PAPER FIBER, DILL AND COLLINS CO., × 35

tank and the flow accurately computed. The following summary gives the principal data of the test:

Grade of Paper	*Book*
Stock furnish (b.d.)	13,537 lb.
Sulphite	8,411 lb.
Soda	1,283 lb.
Broke	773 lb.
Clay, size, etc.	3,071 lb.
Paper made	10,400 lb.
Dry broke and trim	1,509 lb.
Wet broke	224 lb.
	12,133 lb.

White water discharged from settling tanks:

During test	90,812 gallons
Average per hour	15,135 gallons
Per day	363,248 gallons
Per ton of paper	18,089 gallons

Average pounds of material per 1,000 gallons of water to settling tank:

Fiber	*Filler*	*Total*
5.25	7.35	12.6

Average pounds of material per 1,000 gallons discharged *from* tanks:

Fiber	*Filler*	*Total*
0.085	0.463	0.548

Pounds of material lost from settling tank:

	Fiber	*Filler*	*Total*
During test	7.71	42.05	49.76
Average per hr.	1.285	7.01	8.293
Average per day	30.8	168.2	199.

Percentage of material loss in white water or the final effluent based on paper made:

Fiber and *Filler*, 0.49%

NOTE: 84.5% of this amount is filler.

Water from bottom of saveall going back to paper machines. Material per 1,000 gallons:

Fiber	*Filler*	*Total*
13.56	17.6	31.16

Note—Subject to correction.

This flowed continuously from the settling tank to the machine in approximately a 4-inch stream, but could not be measured.

The tests showed that the sedimentation tanks worked very effectively and reclaimed 95.6 per cent of the fiber and clay going to the tank. The paper made by the mill is a very high grade bond and no trouble is experienced on account of dirt from the saveall. Great care is taken to keep the original stock clean.

The continuous sedimentation type of saveall appears to be adapted to mills using a large amount of clay, although it is being tried out on news stock and attains an efficiency of 75 per cent as shown in Table 6. With the use of an improved design and coagulents such as Boothal it is expected to get results nearly equivalent to those given for halftone, which is 97.6 per cent.

The analysis of the savings made by an installation of the sedimentation tank system is similar to that used in figuring the value of a screen saveall. The following estimates are based on average cost figures and different values for reclaimed stock:

Estimated Costs and Saving with Sedimentation Tanks

Book and bond—50-ton mill—2 machines.

2 concrete sedimentation tanks @ $9,000=$18,000.
(Complete installations including pumps and piping, etc.)

Interest on investment @ 7%	$1,260
Depreciation @ 5%	900
*Additional power for pumps (25 hp. @ $36 per hp. year)	900
Labor and repairs	50
Total annual cost of reclaiming stock	$3,110

*A major part of the pumping cost is necessary in mill without tank system.

Savings

Fiber and Filler Reclaimed Per Day, lb.	Percentage of Reclaimed Material	Value of Reclaimed Material Per ton	Gross Yearly Value of Material Reclaimed	Net Saving
1,000	1	$50	$7,500	$4,390
		25	3,750	640
2,000	2	50	15,000	11,890
		25	7,500	4,390
4,000	4	50	30,000	26,890
		25	15,000	11,890

Filler is usually about 50 per cent of total material saved.

Conclusions

The important points to be considered in connection with the various saveall systems are summarized as follows:

1. Measurement of all water going away from the mill and the determination of the extent of losses.
2. Reclamation of all possible stock in white water by using it at the source through self-cleaning showers and other means.
3. Computation of actual money savings and adoption of a saveall adapted to the particular grade of stock used.
4. Especial attention should be given to mechanical condition of the screen saveall.
5. Location of equipment should be so that stock is returned to the system whenever possible.

Microscopic Examinations

Samples of paper and white water were collected during the test at Dill & Collins, and submitted to the Forest Products Laboratory, Madison, Wis., together with other samples from the Miami

Paper Company, and the Pejepscot Paper Company. The fiber lengths in each sample were measured and five photo micrographs made (Plates 1, 2, 3, 4 and 5) that show the fiber in paper and white water.

The results indicate that white water contains fiber of average lengths in a majority of cases, as shown in the following table:

U. S. DEPARTMENT OF AGRICULTURE

FOREST SERVICE, FOREST PRODUCTS LABORATORY

Data on ash and fiber measurements on paper and white water sediment

Dill & Collins
Offset Paper

P334. Paper made ..... Offset
Ash ..... %
Fiber length, average of 100 measurements..1.84 mm.

P333. Sediment from white water collected during the manufacture of P334.
Ash 43.3%
Fiber length, average of 100 measurements..0.73 mm.

Samples submitted by G. D. Bearce, Vice-chairman of Waste Committee.

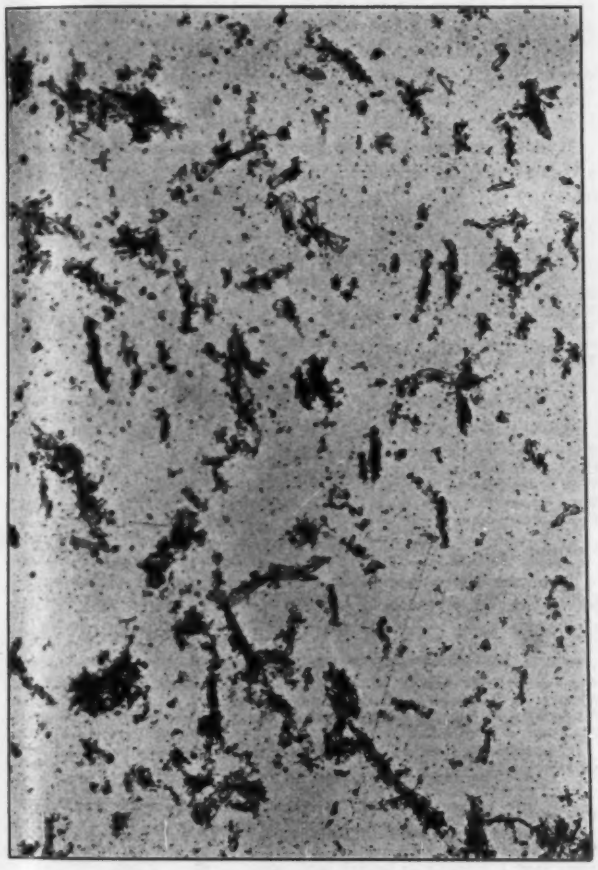


PLATE 2—SEDIMENT FROM WHITE WATER, DILL AND COLLINS CO., × 35

Miami Paper Company
Color Plate Paper

P338-3. Paper made .....46-lb. Color Plate
Ash ..... %
Fiber length, average of 50 measurements..0.58 mm.

P338-1. Sediment from white water to the beater:
Total solids, per 1,000 gallons.....5.5 Lb.
Ash in dry sediment.....49.9%
Fiber length, average of 50 measurements..0.64 mm.

P338-2. Sediment from white water to the machine:
Total solids, per 1,000 gallons.....1.6 Lb.
Ash in dry sediment.....42.9%
Fiber length, average of 50 measurements..0.59 mm.

Samples submitted by O. P. Gephart, Chief Chemist.

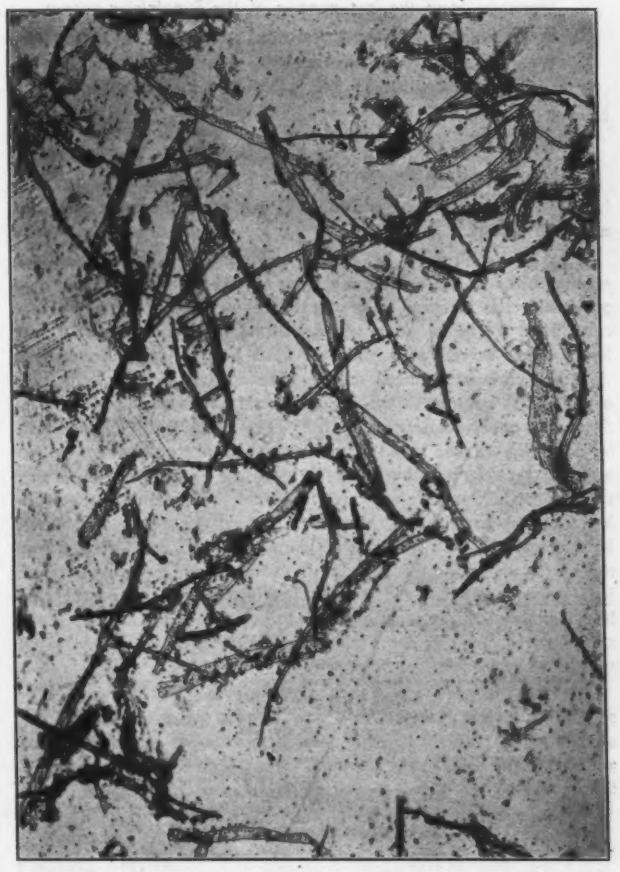


PLATE 3—COLOR PLATE PAPER FIBER—MIAMI PAPER CO., × 35

Pejepscot Paper Co.
News Print Paper

Sample No.	*Description*	*Length Average of 50 measurements*		
			Total Solids Pounds per 1,000 gallon	Ash per cent
		mm.		
P339	News print paper.....	0.99	..	..
P340-1	Paper machine white water to saveall	1.58	4.1	2.0
P340-2	Groundwood mill white water to saveall.....	0.48	5.3	1.4

Samples sumbitted by W. E. Brawn, Superintendent of Research.

TESTS ON STOCK BALANCES

A number of tests were conducted by the Eastern Manufacturing Company, Pejepscot Paper Company, and Watab Paper Company. A short summary, together with tables and quotations, outlines the important points.

Shrinkage of Materials in the Manufacture of Paper, Eastern Mfg. Company, H. H. Hanson

NOVEMBER, 1921.

A very complete test was made of the stock balance of the paper mill in this test on writing paper with the following furnish: Bleached sulphite, 62 per cent; bleached soda, 9 per cent; shavings,

19 per cent; filler, 10 per cent. The stock and paper were all carefully weighed. The test covered a period of 8 hours, 27 minutes.

The waste white water from the paper machine consists of the following:

1. Drainage from the last quarter of the fourdrinier screen.
2. Wash waters from the screen upon its return to the headbox.
3. Water from the four suction boxes adjacent to the dandy roll.
4. Water from the suction couch roll and suction box just beyond.
5. Water from the squeeze or pressure rolls.
6. Drainage from the floor when the machine is washed down.

The following dilution method was used to measure the volume of white water:

A carboy of 50 degs. Bé. caustic solution was obtained from the cooling tanks at the caustic evaporators, and was fed into the drip pan under the machine at a constant known rate. This was accomplished by means of a vertical 2-inch glass tube about 3 feet long, which served at a constant head box to feed the caustic. A screw cork was placed on the tube running from the bottom of this glass column to the drip pan, and a predetermined rate of flow was approximately regulated. The head was kept constant by admitting caustic into the tube at the same rate, from a siphon attached to a storage bottle. The quantity of caustic fed to this storage bottle was carefully measured and the time noted, care being taken to have the initial and final levels equal, in this bottle. In this way the rate of feed was known for each run. Samples of the waste water were taken in the trough in the basement floor just before admitting the caustic, and also after the caustic had been running for seven or eight minutes. Good mixing was probably secured, both in the outlet of the drip pan and in the brick tank.

The two samples were then analyzed, the first titrated with standard NaOH, it being acid and serving as a blank, and the second with standard HCl. From these analyses and the rate of admittance of the strong caustic (normality—16.14) the rate of flow could be calculated as gallons per minute.

Totals—Input—Bone Dry

	Lb.
Sulphite pulp	11,290
Soda pulp	1,640
Shavings	3,570
Wet broke	763
Filler	2,100
Alum	368
Rosin size	539
Saveall white water pulp	146
Total b. d. material fed	20,416

Total Output—Bone Dry

	Lb.
Paper	16,123
Dry broke	1,607
Wet broke	633
Saveall white water fiber	136
Accumulation of fiber in white water tank	6
In system at end of run	18
Loss from saveall overflow	10
Loss from beaters	25
Loss in white water to sewer	706
Total measured output	19,264

Ash and Soluble Matter Loss

Loss of materials other than fiber as determined by ash balance—not elsewhere included:

Input

	Lb.
Ash in filler	2,100
Ash in shavings	378
Wet broke	80
Alum—Anhydrous	368
Size	41
Total ash input	2,967

Output

	Lb.
Paper and broke	1,930
Loss in ash	1,037
Added to output and known loss	20,301
Loss unaccounted for (20,416—20,301)	105

Water and Stock Balance—Pejepscot Paper Co.

W. E. Brawn

March, 1923.

This test was made on No. 7 and No. 8 news machines with capacities of 38 and 46 tons daily, respectively.

All of the water going to sewers was measured and consistencies determined. The mill saveall system was measured as well as the fresh water supply.

Taking the wire length from breast roll to couch, we make three divisions, calling them "wire pit," "saveall pit" and "couch pit." There are two machines with a single white water tank and one thick stock tank serving for both. All water going to the wire pit goes direct to the river; all water going to the saveall pit goes to the white water tank, and in case of breaks, when the stock is left on the wire, the plug in the couch pit is pulled and the thick stock goes to a tank from which it is pumped back to the beaters.

In the normal operation, all the water coming to the couch pit overflows into the saveall pit and goes to the white water tank. There is a wire shower over the couch pit and another wire showed over the saveall pit.

In the following table the amount of water and consistency is given for running conditions. Consistency figures are on bone dry basis.

Water to the wire pit	*No. 7 Mach.*		*No. 8 Mach.*	
Source	*g.p.m.;*	*cons. %*	*g.p.m.;*	*cons. %*
Leaks and spills at milling box	5	.22	8	.22
Screenings sluicing water from bird screens	25	..	50	..
Waste suction box water	90	.04	15	.04
Wire shower before breast roll	94	fresh	120	fresh
Hose water	80	fresh	80	fresh
Deckle strap showers	5	.02	9	.07
Tray water spills and wire losses	20	.22	25	.20
Total	319		307	
Water to saveall pit	*g.p.m.;*	*cons. %*	*g.p.m.;*	*cons. %*
Suction water from suction boxes	40	.04	210	.04
Overflow from mixing box	35	.22	41	.22
Wire shower over couch pit	150	fresh	180	fresh
Wire shower over saveall	125	fresh	135	fresh
Couch press water	11	..	13	..
Total	361		379	

From the above figures of water to the saveall pit, there are 940 gallons per minute going to the white water tank. From this white water tank, the distribution is as follows:

Distribution of water from white water tank:

Water coming into tank	940	g.p.m.
Water going from tank to beaters, average per day	85	g.p.m.
Water going to Moore & White savealls	389	g.p.m.
Water going to river	466	g.p.m.

The following summary of water going to the river includes several items not mentioned above:

	g.p.m.	Ave. cons. %	lb/day
Water from wire pits	626	.022	1,655
Overflow of white water tank	466	.025	1,400
Waste suction water 7 machine	80	.040	384
Water from 7 presses plus bearing cool. water	88	.010	105
Water from 8 presses plus bearing cool. water	100	.010	120
Filtered white water from M. & W. savealls	300	...	...
Waste white water not used by M. & W. savealls	89	.025	268
Total stock bearing waters to river	1,749	...	3,932

The above shows that we are normally losing 3,932 pounds bone dry per day. This would be true if we never had a break or a wash-up. We have run a lot of tests and have about proved that in addition to the above figure, we lose on the average 2,000 pounds of stock per day due to breaks and wash-ups. This figure fluctuates considerably. This is for the reason that whenever stock is held on the wire and is showered off into the couch pit, a certain

amount overflows into the saveall pit before the beater engineer gets the plug pulled to put this thick stock into the thick stock tank for delivery back to the beaters. Each minute that this happens on a whole mill basis is about 110 pounds of stock.

We have further checked total sewer losses with consistency and our losses show an average of 6,000 pounds per 24 hours, or

PLATE 4—SEDIMENT FROM WHITE WATER TO PAPER MACHINE—MIAMI PAPER CO., × 35

4 per cent. Due to our layout, we cannot get a good weir measurement of our main sewer.

White Water Measurements and Stock Balance at the Watab Paper Company

S. D. WELLS, FOREST PRODUCTS LABORATORY

This report is a complete survey of the white water utilization and saveall systems of the Watab Paper Company. The volume of waste water was measured and an analysis made of the soluble and insoluble solids.

A stock balance was obtained covering a period of about eight days as follows:

		Waste Product			
Furnish	Tons	Paper Tons	Insoluble Tons	Soluble Tons	Unaccounted for—Tons
Fiber:					
Sulphite	45				
Book stock	41				
Shavings	18½				
Groundwood	200				
	304½	255	38½	6	5
Clay	41	27	13	..	1
Alum	5½				
Size	3½	3*	1½	5½	½
Silicate	1½				
	356	285	53	11½	6½

The furnish for the period amounted to 125 per cent of the bone dry weight of the paper furnished. The fiber furnish amounted to 119⅓ per cent of the fiber in the paper. An average retention of 65 per cent of the loading material was obtained.

Of the paper run during the period 88 per cent averaged 10 per cent ash, while 12 per cent averaged 4½ per cent ash. The performance during the period can be taken as typical with the usual run of Diamond C book paper.

Determination of proportion of pulp production obtained from solids in white water No. 2 paper machine May 27, 1922:

Average ash in lap pulp..... 2.25 per cent
Retention as determined above.....77 per cent
Ash in stock from chest as computed from above data..... 2.92 per cent
Ash in insoluble solids from white water No. 2 machine.....33.3 per cent
Ash in groundwood pulp free from white water..... 0.36 per cent

No conversion stock present.
Let X = proportion of stock derived from white water.
100 — X = proportion of stock groundwood.
XX 33.3 + (100 — x) .36 = 2.92 × 100.
32.9X = 256. X = 7.78 per cent.
Reported production of pulp = 76 tons.
7.78 × 76 = 5.82 tons present in pulp.
Furnish on No. 2 machine 91,930 pounds.
12.7 per cent of furnish recovered in pulp.

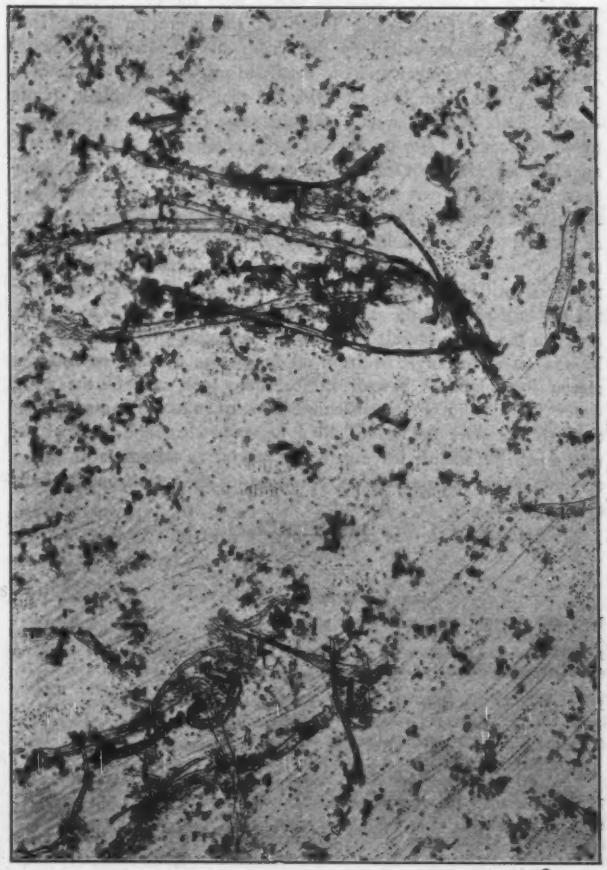


PLATE 5—SEDIMENT FROM WHITE WATER TO BEATERS—MIAMI PAPER CO., × 35

In the first test the results obtained seem to indicate that the solids recovered from the white water of No. 2 machine amounted

*Ash from sizing material in paper was not determined for this balance, but has been found in other work on similar furnishes to amount to approximately 1 per cent.

to 24 per cent of its production and in the second test 7 per cent. In the third test it amounted to 12½ per cent of the total furnish, which with average performances would amount to 15 per cent of its production. From these tests it is reasonable to assume that an average of 15 per cent of the production or 12½ per cent of the furnish of No. 2 machine was recovered from the white water by the pulp.

SUMMARY OF TESTS

	1	2 Nov. 17, 1921	3 May 27, 1922
Total pulp production, tons per 24 hours	69	28	76
Total paper production, tons per 24 hours	40	40	40
Groundwood pulp production, tons per 24 hours	25	28	76
Conversion pulp production, tons per 24 hours	35	0	0
Furnish on No. 2 machine, tons	..	..	45.97
Ash in white water from No. 2 machine, per cent of total solids	40	40	33.3
Ash in wet lap stock, per cent	6.1	3.6	2.25
Retention of clay on wet machine, per cent	80	80	77
Ash in stock in chests supplying wet machines, per cent	7.5	4.5	2.9
Ash in groundwood pulp, per cent	0.7	0.7	0.36
Ash in conversion stock, per cent	3.3	..	..
Recovered stock, per cent of pulp production	14	9.9	7.78
Recovered stock, per cent of paper production, No. 2 machine	24	7.0	12.7

Savealls

The type of savealls installed under both the No. 1 and No. 2 machines saves considerable stock but the operation is far from perfect. Whenever tested by the writer the performance was not better than 30 per cent and the insoluble matter in the water after passing varied from 0.05 to 0.08 per cent of the weight of the waste. Tests at another mill with the same type showed efficiencies of 40 per cent. Tests on another type of cylinder saveall showed an efficiency of 62 per cent. The stock going to the saveall, however, was 0.0741 per cent while that to the first mentioned was 0.0476 which may have favored the performance of the latter machine. At the same mill two sloping screen save alls were also used. One covered with 65 mesh wire reduced the consistency of the stock to 0.052 per cent while the other with 75 mesh wire over the top half reduced the consistency to 0.027 per cent. On another occasion the latter saveall reduced the consistency to 0.020 per cent. It was set at an angle of from 50 degrees to 60 degrees and was eleven feet high. A saveall 15 feet long took care of the white water from a forty ton machine. As a rule the water passed through the wire before it had gone more than one-third of the way down the incline leaving the remainder to take care of surges or times when the sheet was passing under the couch on the fourdrinier above.

APPENDIX

EXHIBIT "A"

Fiber Losses

Their Measurement and Reduction

1. Kind of paper made.....
2. Normal daily production.....tons
3. White water to sewer per day.....gallons
4. Method of measuring white water.....
.....
5. Method of sampling white water.....
.....
6. Fiber per 1,000 gallons of white water effluent:
   (a) Total solids .....lb.
   (b) Ash free fiber.....lb.
7. Fiber loss per ton of product.....lb.
8. Present methods of re-using white water:
   (a) beater room .....
   (b) machine room .....
   (c) other uses .....
.....
9. Method of fiber recovery:
   (a) Type of saveall.....
.....
   (b) Water through saveall per day.....gallons
   (c) Fiber recovered per day.....lb.

Company .....
Reported by .....

Date .....

If figures given are estimates please so indicate.
Please use other side of sheet for additional remarks.

Sample of questionnaire sent out by the Forest Products Laboratory September, 1922.

TABLE 2—LABORATORIES XYZ PAPER COMPANY

Quantity of Stock in Waste Water Going to General Saveall

Composite sample of one pint samples taken every fifteen minutes from 7:30 A. M. to 2:00 P. M. on September 21, 1922.

Amount of solids.....0.2378 g. per liter
Amount of waste water approx. 12,000,000 gallons or 45,000,000 liters per day
Pounds of air dry stock per 24 hours, 26,212..... = 13 tons
General save all production—June, 1922..... = 25 tons
General save all production—July, 1922..... = 24.6 tons
= 1 ton per day

MILL CONTROL LABORATORY

(Signed) A. B. C.

Mill Waste Going to General Saveall—Microscopical Examination

From composite sample taken at 15 minutes intervals 7:30 a. m.—2:00 p. m. 9/21/22.

The fibers average two-thirds full length. They average much longer than stock going to the paper machines.

There is a moderate amount of fibrillae and abundant fine material. About the same amount of fibrillae but more fine material than in stock going to paper machines. Much of the fine material is not cellulose; it is probably clay.

About 20 per cent of the fiber is unbleached. Approximately 50 per cent of this is long and the balance broken fiber or small ray cells from wood.

This material contains a larger amount of fine dirt than ordinary stock but it is not what would be called dirty.

Microscopic Examination of Stock from General Saveall Wet Machine

Sample made 10:00 a. m., 9/22/22.

This stock averages about one-third the length of whole fibers. It contains a very large amount of fine material, both fibrous and non-fibrous. It is very dirty.

The fiber in this stock averages a little shorter than stock going to paper machines. There is much more fine material and dirt than in regular stock.

Contains about 10 per cent unbleached fiber.

Sample made before 9/21/22.

This stock averages about two-fifths the length of whole fibers. It contains a very large amount of fine material, both fibrous and non-fibrous. It is very dirty but not as dirty as stock described above.

Contains about 60 per cent unbleached fiber.

In comparison with stock shown in composite sample of material going to general saveall, reported under date of 9/21/22, this stock is about half as long, contains very much more fine material, and is much dirtier.

Fiber Losses in Paper Mill

All determinations made on composite sample taken over an eight hour period at one hour intervals June 29, 1921. The amount of matter in suspension was determined by allowing to settle, clear portion decanted and remainder filtered through filter paper and weighed.

No. 1

SOURCE. Main sewer from No. 1, 2, 3 and 4 paper machines. The manhole to this sewer is located in sulphite pulp store room.

QUALITY. 60 per cent sulphite fibre, medium to short length. 40 per cent non-fibrous (alum, rosin, etc.)

AMOUNT. 1.48 lb. per 1,000 U. S. gallons water.

No. 2.

SOURCE. Water passing through wire No. 1 machine.

QUALITY. 80 per cent sulphite reduced to little or no length. 20 per cent non-fibrous.

AMOUNT. 6.21 lb. per 1,000 U. S. gallons water.

This white water is immediately re-used on paper machines.

No. 3.

SOURCE. Water removed from wet sheet by suction roll No. 1 machine.

QUALITY. 10 per cent sulphite, medium to short length.
90 per cent non-fibrous.

AMOUNT. 0.052 lb. per 1,000 U. S. gallons water.

No. 4.

SOURCE. Water which has been used in washing the wire No. 1 machine. Also if paper breaks at suction roll it will be collected in this water.

QUALITY. Nearly all fiber mostly long to medium length.

AMOUNT. 0.035 lb. per 1,000 U. S. gallons water.
This water is re-used in furnishing beaters.

No. 5.

SOURCE. Water going to sewer from No. 1 machine.

QUALITY. 70 per cent sulphite, long to medium and some short
30 per cent non-fibrous.

AMOUNT. 0.371 lb. per 1,000 U. S. gallons water.

No. 6.

SOURCE. Water going to sewer from No. 2 machine.

QUALITY. 50 per cent sulphite long to medium and short.
50 per cent non-fibrous.

AMOUNT. 2.85 lb. per 1,000 U. S. gallons water.

No. 7.

SOURCE. Water going to sewer from No. 3 machine.

QUALITY. 60 per cent sulphite long to medium and short.
40 per cent non-fibrous.

AMOUNT. 5.15 lb. per 1,000 U. S. gallons water.

No. 8.

SOURCE. Water going to sewer from No. 4 machine.

QUALITY. 70 per cent sulphite long to medium and short.
30 per cent non-fibrous.

AMOUNT. 2.31 lb. per 1,000 U. S. gallons water.

MILL CONTROL LABORATORY.

(Signed) A. B. C.

Fiber Losses in Sulphite Mill

The following determinations of fiber losses at various points in the Sulphite Mill were made on composite samples obtained at one-half hour intervals over an eight hour period. The determinations were run on three separate days.

The results were obtained by carefully filtering the waters from the sewers and then by examination and weighing of the dry filtered material. When quantity is expressed throughout this report, the amount of bone dry material per 1,000 U. S. gallons is meant unless it is otherwise stated.

No. 1.

SOURCE. Main sewer from all blowpits.
This contains the spent acid and wash water from all blowpits. Any fiber contained in this is lost.

QUANTITY.	3/3/21	12/15/21	12/27/21
	0.557 lb.	1.74 lb.	1.64 lb.

QUALITY. Practically 100 per cent long fiber as in ordinary unbleached sulphite. 5 per cent of this is not cooked.

No. 2.

SOURCE. Water removed from stock by pulp thickeners. The major portion of this water is used for washing stock in the blowpits, the remainder is used for washing logs in the wood room. Any fiber contained in the water going to wood room is lost.

QUANTITY. Amount per 1,000 U. S. gallons.

3/3/21	12/15/21	12/27/21
0.935 lb.	0.247 lb.	0.451 lb.

QUALITY. 40 per cent of this is fiber. Some of the fiber is long, but most of it is short. 60 per cent is pitch and dirt.

No. 3.

SOURCE. Floor wash from east side of old screen room and water from tailing thickener. This goes directly to sewer. Any fiber contained in this water is lost.

QUANTITY.	3/3/21	12/15/21	12/27/21
	.....	0.806 lb.	0.748 lb.

By determining the consistencies entering and leaving the thickener we were able to compute the approximate number of gallons of water removed per ton of pulp made. Approximately 128,000 gallons of water are removed per air dry ton of stock, or approximately 100 lb. of stock is lost at this point for every air dry ton of tailings made. This would mean the approximate daily loss at this point is 400 lb.

QUALITY. 60 per cent of this is fiber. One-half of the fiber is long. 40 per cent pitch and dirt.

SOURCE. Floor wash from west side of screen room and white water from XX worm thickener. Also some overflow from No. 1 worm thickeners. This goes directly to sewer. Any fiber contained in this water is lost.

QUANTITY.	3/3/21	12/15/21	12/27/21
	0.876 lb.	0.207 lb.	0.959 lb.

QUALITY. 80 per cent of this is fiber. Mostly short. 20 per cent pitch and dirt.

No. 5.

SOURCE. Water going to sewer from pneumatic save all. Any fiber in this water is lost.

QUANTITY.	1/3/21	12/15/21	12/27/21
	.....	0.280 lb.	0.476 lb.

QUALITY. 95 per cent of this is fiber. Half of the fiber is long. 5 per cent pitch and dirt.

No. 6.

SOURCE. Overflow from trough in back of No. 7 wet machine. This is backwater from the wet machine and goes directly to the sewer. Any fiber in this water is lost.

QUANTITY.	3/3/21	12/15/21	12/27/21
	.....	0.261 lb.	0.156 lb.

QUALITY. 50 per cent fiber, less than half of this is long. 50 per cent pitch and dirt.

No. 7.

SOURCE. Water from worm thickeners from Bellmer bleachers. This water goes to storage box near No. 5 paper machine and is used again in rifflers. The overflow from the storage box goes to the sewer. There is approximately 12,000 gallons of water removed by the thickeners per ton of air dry pulp.

QUANTITY.	3/3/21	12/15/21	12/27/21
	1.43 lb.	0.982 lb.	0.465 lb.

QUALITY. 60 per cent of this is fiber. One-half of the fiber is long. 40 per cent pitch and dirt.

No. 8.

SOURCE. White backwater from bleached pulp washer. The greatest part of this water goes to the rifflers, the excess flows to sewer.

QUANTITY.	3/3/21	12/15/21	12/27/21
	1.014 lb.	1.092 lb.	0.979 lb.

QUALITY. Practically 100 per cent pure fiber. Half of this is long.

MILL CONTROL LABORATORY.
(Signed) A. B. C.

TABLE 3

Report on Test of Bird Saveall in Boxboard Mills

The stock from the saveall was pumped to one of our beaters, the contents of which was determined by calculation and the beater allowed to run full. The beater was then placed in operation in order to insure through circulation of the stock and a sample three gallons of the suspension was extracted. This quantity was then passed through a fine mesh screen and the weight of the dry pulp remaining above the screen was determined.

The following table shows the amount of time to fill this beater, the contents of which are 2,400 gallons, together with the dry weight of the pulp screened from the sample three gallons of solution and the calculated weight of usable materials in the beater:

Time to fill beater	Volume of sample	Dry weight of pulp in sample	Calculated weight of contents
18 hr.	3 gal.	16 oz.	867 lb.
15 hr.	3 gal.	10½ oz.	848 lb.
18¾ hr.	3 gal.	15 oz.	840 lb.
14 hr.	3 gal.	12 oz.	660 lb.
65¼ hr.			3,215 lb.

It may be seen from the above test that this saveall is reclaiming for us stock at the rate of 50 lb. per hour or 1,200 lb. per day, with which we are quite satisfied.

The wire covering of the saveall above is No. 40 mesh. The waste water delivered to the saveall is the normal discharge from 40 tons of boxboard, sheathing and bogus.

TABLE 4

Marathon Paper Mills Co., Rothschild, Wis.

Through the courtesy of M. M. Whitman, sulphite superintendent, I received the following report of some tests made on fiber recovered from the blow pits:

"On the 20th of July a run was made on the wash liquor from the blow pits, and during this time the washings from 10 blow pits was collected and allowed to settle and drain through an old set of bleach drainers covered with matting.

"The weight of the wet stock was 2,480 pounds and a moisture test taken showed that the stock contained 86.50 per cent of water, leaving 335 pounds of air dry stock or 35½ pounds of air dry stock per digester.

"The second run on waste liquor was made on the 27th of July and during this run the washings from 23 blow pits or 322 tons was collected, the wet weight of the stock being 500 pounds and containing 90 per cent of water, leaving 500 pounds of air dry stock or approximately 22 pounds per digester."

TABLE 5

July 22, 1922.

Comparison of Saveall Equipment

Types of equipment—
(a) Bird.
(b) Improved Paper Machinery Co.
(c) 2 Types Inclined.

Size of Equipment—

Location of save all	Size	Angle	Wire Mesh
On 1 and 2 machines	11' x 32' face	50 deg.	75 top—65 bottom
On 4 machines	11' x 32' face	55 deg.	65

65 mesh wire is used fourdrinier wire. Wire used on Bird and improved savealls is their regular wire.

Work done by different types of savealls—

	Improved	Bird	1 & 2 Inclined	4 Inclined
Going to—% b.d.	0.0476	0.0741	0.038	0.095
Going from—% b.d.	0.0288	0.0282	0.027	0.052

Tests given are average of hourly samples covering several hours of normal operation.

No. 1 and 2 machines combined daily capacity—85 tons.
No. 4 machine daily capacity—70 tons.

Test of Saveall Efficiency

	Improved No. 1 Machine	Bird No. 2 Machine
Period covered by test	3 p. m. Oct. 25 to 3 p. m. Oct. 26—24 hours	5 p. m. Oct. 24 to 7 a. m. Oct. 25—14 hours.
White water from machine—		
Average flow	570.6 g. p. m.	508.6 g. p. m.
Density	0.0476 % bone dry	0.0741 % bone dry
Stock per minute	2.26 lb.	3.14 lbs.
Stock per day	3254.4 lb.	4521.0 lb.
Overflow—		
Average flow	361.8 g. p. m.	116.4 g. p. m.
Density	0.0476 % b. d.	0.0741 % b. d.
Stock per minute	1.44 lb.	0.72 lb.
Stock per day	2073.6 lb.	1036.8 lb.
Through saveall—		
Average flow	325.0 g. p. m.	392.2 g. p. m.
Density	0.0288 % b. d.	0.0282 % b. d.
Stock per minute	0.78 lb.	0.92 lb.
Stock per day	1075.2 lb.	1324.8 lb.
Stock reclaimed per day		1859.4 lb.

TABLE 6

International Paper Company

Water From News Machines

	Continuous speed	Variable speed
Supply to savealls—lb./100 gal.	0.616	0.616
Water through saveall—lb./100 gal.	0.316	0.166
Per cent of supply removed	048.7	073.0

Water from Sulphite Deckers and Presses

Supply to inclined wire saveall—lb./100 gal.	0.074
Water through inclined wire saveall—lb./100 gal.	0.027
Per cent of supply removed	0.63.5

The above save all equipment is all covered with old 60-mesh machine wire.

Loss from Above News Mill

Average gal. per min. to sewer	1,970
Average lb. per 100 gal.	0.195
Total loss per day	5,520 lb.
Per cent loss of production	1.95

Settling Tank Equipment (News Machine)

Rectangular tank about 10' x 12' x 30' with "V" bottom	
Avg. supply to tank lb./100 gal.	0.83
Avg. overflow from tank lb./100 gal.	0.22
Avg. water from bottom of tank lb./100 gal.	3.00
Per cent of supply removed	73.5
Avg. gal./min. overflow	210

Total Sewer Loss From Above Mill

Gal. per min.	470
Avg. lb./100 gal.	0.170
Total loss lb./day	1,150
Per cent loss of production	1.75

Settling Tank Equipment (Halftone Machine)
Special Tank

Avg. supply to tank lb./100 gal.	0.916
Overflow from tank lb./100 gal.	0.023
Water from bottom of tank lb./100 gal.	2.8
Overflow from tank gal./min.	175
Loss from tank lb./day	58
Per cent loss of production	0.2
Per cent of supply removed	97.6

TABLE 7

American Writing Paper Co. Gill Division—Reclamation of Fiber Bird Saveall

1. METHODS OF RE-USE OF WHITE WATER:
The pan water directly under the wire, rich in fiber and filler, is used over again in the head box of the machine. The suction box water goes back and is used in the head box.

2. METHODS OF RECOVERING FIBER FROM WHITE WATER:
The saveall are of the Bird strainer type with a capacity of about 20,000 gallons per hour. The suction couch roll water goes directly to the savealls. This contains very little fiber and filler. The water from under the wire and presses goes directly to the savealls. In case of a break at the couch, the sheet piles up in the pit and instead of being dumped back into the machine chest, the stock is allowed to accumulate in the pit, and then washed down into a cement, white water, storage tank. The overflow from this tank goes to the saveall.

3. Measurement of White Water Losses:

The volume of water going to the savealls is measured by a V notch weir. For the purpose of calculation, it is assumed that the same volume is discharged in the waste as enters each saveall. Samples are taken regularly to show the strength of the inlet water and the waste from each saveall.

4. Data and Results:

(a) Actual Losses:

1. Volume of white water rejected	30,868 gal. per hr.
2. Total solids in white water in per cent	0.04%
3. Ash free fiber in white water in per cent	0.03%
4. Total pounds solids lost per ton of product	50 lb.
5. Pounds ash free fiber lost per ton of product	39 lb.

(b) Efficiency of saveall systems.

	To Savealls	From Savealls
1. Volume of white water	30,868 gal. per hr.	
2. Solids in white water in per cent	0.11	0.04
3. Ash free fiber in white water in per cent	0.10	0.03
4. Solids in white water in pounds	272 lb. per hr.	90 lb. per hr.
5. Ash free fiber in white water in lbs.	250 lb. per hr.	75 lb. per hr.
6. Volume of white water		30,868 gal. per hr.
7. Solids in white water in per cent		0.04
8. Ash free fiber in white water in per cent		0.03
9. Solids in white water in pounds		90 lb. per hr.
10. Ash free fiber in white water in lbs.		75 lb. per hr.
11. Solids recovered in pounds		183 lb. per hr.
12. Ash free fiber recovered in pounds		175 lb. per hr.

(c) Cost of Operation:

No accurate data as to the cost of operating the savealls can be given at this time. However, on a 13 day test, it was found that the total expense for millwright labor to keep them at the highest efficiency, was found to be ½ of 1 per cent of the amount saved by the savealls.

(d) The foregoing data was taken on a run of U. S. Government postal card. The stock from the savealls was used to replace part of the magazine stock in the furnish.

We regret that we can offer you no conclusions either as to the cost of operation or the point of economy in the reclaiming of white water losses. Our investigations were not complete enough to justify any definite conclusions. We trust, however, that the information will be of service in preparing your report.

(Signed) Milton M. Manshel,
Asst. to Production Engineer.

The Utilization of Waste Bark

Supplementary Report of the Sub-Committee on Waste

By J. D. Rue, Chairman; H. S. Taylor and E. P. Gleason.

Your Committee has continued its study of the utilization of pulp mill barker waste as a fuel in 1920. Half of the spruce, balsam fir and hemlock consumed in the United States came to the mill as rough wood. The 2,400,000 cords of wood so used at 2,500 pounds dry weight per cord would on the reasonable assumption of 15 per cent waste yield 456,000 tons to be disposed of each year. A large proportion of the bark is removed by the wet drum method and it is not unreasonable to assume that the untreated bark will average 65 to 75 per cent moisture. This high moisture content constitutes a material obstacle to its use as a fuel. The investigation by the Committee has indicated that under favorable conditions of furnace design and operation it should be possible to burn bark of 65 per cent moisture and even without the addition of coal. It is possible, however, with presses now on the market to readily reduce the moisture content to 50 or 55 per cent at a reasonable cost for equipment, power and attendance.

Few mills have made a consistent effort to develop efficient methods for burning their bark. Some study has been made of suitable designs of furnaces and methods of operation for burning wet spent tan bark, fogged fuel, bagasse, etc. The data on a few tests on these materials were given in the report of this Committee at the Detroit meeting in October, 1922. Further detailed reports on studies of this kind are given by H. S. Bastian, of the Portland Railway Light and Power Company, and by D. M. Myers of the U. S. Bureau of Mines. "Generating Power from Waste," *Electrical World*, February 25, 1922, by Mr. Bastian will be reprinted, for the benefit of the members of TAPPI, as an appendix to this report. "Economic Combustion of Waste Fuels," by D. M. Myers, Technical Paper No. 279 (1922) U. S. Bureau of Mines, may be obtained from that Bureau or from the Superintendent of Documents, Washington, D. C., and is strongly recommended for careful study. It summarizes some of the most recent developments in the design and operation of furnaces for burning fuels containing amounts of moisture comparable with those met with the problem under consideration by this Committee. Myers reports a complete boiler test of an old furnace burning paper mill refuse and chestnut extract chips in combination with coal, which gives an efficiency of 40.2 per cent; without coal the efficiency was estimated at 25 per cent. A furnace specially designed for the purpose gave 52.6 per cent to 64 per cent efficiency without any coal. The fuel contained 58 per cent to 61 per cent moisture. Myers* reports an efficiency of 71.1 per cent of wet hemlock tan bark burned with an automatic stoker in a furnace specially designed by him. Bastian, in the reference given, reports the results of tests made by his company which show the increased efficiency obtained by the redesign of their furnaces for hogged Douglas fir mill waste. By tests on 500 hp. B & W boilers the efficiency was increased from 44.8 per cent at 114 per cent rated capacity to 71.1 per cent at 246 per cent rated capacity. The duration of the tests was 10 and 15 hours, respectively. One of the characteristic features in the redesigned furnace is a 22 inch hanging arch inserted directly over the bridge wall which compels a more complete mixing of the gases with air.

As pulp mills are normally operated the supply of bark is irregular so that it is not always practical to maintain a continuous supply to the furnace sufficient to operate it at maximum efficiency. It is, therefore, recommended by the Committee that in the study of the problem undertaken by individual mills careful consideration be given to the construction of furnaces provided with underfeed stokers so that variable amounts of coal can be added at will. Forced draft is also desirable. A number of such installations have come to the attention of the Committee and very favorable reports have been received of their operation. Arrangements have been made with several companies, some equipped with underfeed stokers, to make evaporative tests within the next few months.

These tests will include the use of wet and dry bark from both spruce and balsam wood and probably with and without the use of coal.

Saving to the Industry

If the 456,000 tons dry weight, of bark annually produced in pulp mills could be burned at an average moisture content of 65 per cent and at an efficiency of only 50 per cent it would result in a saving of 157,000 tons of coal per year as the following data show:

456,000 tons dry weight are equivalent to—

1,300,000 tons containing 65 per cent moisture.

Heating value of coal assumed at 13,000 B. t. u. per pound.

Efficiency of burning coal assumed at 70 per cent.

Efficiency of burning wet bark assumed at 50 per cent.

Heating value in bark of 65 per cent moisture at 2,200 B. t. u. per pound wet bark.

One pound of coal is equivalent to $13{,}000 \times 70 \div 2{,}200 \times 50 = 8.25$ pounds wet bark.

It is seen, therefore, that 1,300,000 tons of wet bark are equivalent to 157,000 tons of coal, which at a value of $6 per ton represents a saving of $942,000 per year.

A reduction of the moisture by mechanical means to 55 per cent makes one pound of coal equivalent to 5.9 pounds of wet bark and means a total coal saving of 170,000 tons. In other words, a decrease of 10 per cent in moisture in the bark increases the saving of coal 8.3 per cent.

A further saving can be effected if the furnace can be so designed that the efficiency of burning bark containing 55 per cent moisture is raised to 70 per cent. One pound of coal is then equivalent to 4.2 pounds of wet bark resulting in a saving of 238,000 tons of coal representing a value of $1,428,000. Therefore, an increase of the efficiency from 50 to 70 per cent results in a saving of 68,000 tons or 40 per cent.

The cost of bark pressing equipment including the installation will vary with the capacity but averages about $4,000.

A liberal estimated operating cost for a press that will handle the bark from 100 cords of wood per day of eight hours is approximately as follows:

	Power at $36 per hp. year	Repairs per year	10% depreciation etc. per year	Total cost for year	Cost per day
10 hp. motor.....	$120	$80	$400	$600	$2.00
25 hp. motor.....	300	80	400	780	2.60

This represents a cost of 2 cents to 2.6 cents per cord of wood. However, the usual bark press can be forced to 50 to 100 per cent over its capacity and the cost would be lowered in proportion.

It is evident, therefore, that after a reasonable reduction has been made in the moisture of the bark by pressing, the most fruitful line of attack for further increasing the efficient use of bark as a fuel will be to increase the efficiency of combustion by improved design and operation of the furnaces. The reports from the mills which have so courteously offered to the Committee their co-operation should go far toward further demonstration of the value of attention to these possible improvements.

BARK PRESSING TESTS

American Bark Press

The test was conducted at the Port Edwards mill of the Nekoosa Edwards Paper Company, October 5, 1922, and is supplementary to a similar test made August 28, 1922, and given in the First Progress Report, October 9, 1922.

The object of the supplementary test was to determine further efficiencies of the press in mechanically removing moisture from bark under conditions differing from those in the previous test.

Description of the Press

The same press used in the previous test was used and the conditions of operation were modified as follows: The counterweights used on the levers on the first roll were 150 lb. instead of 125 lb., and on the second roll 174 lb. instead of 94 lb. The effective pressure on the rolls is as follows:

First roll	1st roll	2nd roll
Dead weight	800 lb.	800 lb.
Counterweight	3,000 lb.	3,480 lb.
Total weight	3,800 lb.	4,280 lb.
Pressure per inch width of the face..	380 lb.	428 lb.

Pressing Tests

The test was divided into two periods of fifty minutes each. During the first period the bark pumped over in water suspension from the John Edwards mill was the only source feeding the press. The quantity of bark supplied to the press was not sufficient to completely cover the press conveyor at all times. During the second period thoroughly soaked bark was shoveled onto the conveyor to the press by hand and the bark was distributed on its way to the press. Under these conditions the press carried from 1½ to 2 inches of bark under the rolls continuously. Twice during the test the press stalled owing to irregularities in the feed otherwise there was no indication that the capacity of the press had been reached.

Character of the Bark

The bark pressed was from spruce which had been stored in the mill yard approximately 2 years. The logs were floated from the wood storage to the mill and the time in the water was estimated at from 2 to 4 weeks.

Sampling for Moisture

The bark was sampled for moisture before going to the press at frequent intervals. Samples of the pressed bark were taken from each wheelbarrow load of approximately 75 lb. dry weight. All of the bark was weighed on platform scales as in the previous tests.

Data and Discussion

The following table indicates the results obtained in the test on the American Press:

	1st	2nd
Percent. moisture in bark to press.....	73.7	70.1
Percent. moisture in bark from press.....	52.4	56–58.2
Weight of dry bark (lb.).....	613	1,875
Operating time (minutes)	50	50
Pounds of d. b. bark per hour.....	735	2,260
Pounds of b. d. bark per inch of width per hour.....	73.5	226.0

Test of the Giant Nekoosa Bark Press

The test was conducted at the Port Edwards mill of the Nekoosa Paper Company, October 5, 1922.

The object of the test was to determine the efficiencies of the press in mechanically removing moisture from bark.

Description of the Press

The press was of the continuous operating baler type in which the plunger operated horizontally. The bark was forced into a square steel channel 12 inches in cross section inside measurement. The pressure channel was of uniform cross section for a distance of 26 inches from the hopper. The remaining 20 inches of the channel was flared slightly so that at the outlet the cross section measured 12¼ inches across. The bottom plate was flat so that the height of the opening was 12⅛ inches. The side and top plates of the pressure channel were steel and the bottom plate iron, thoroughly reinforced. All of the plates are perforated with holes ⅛ inch inside diameter and ⅛ inch outside diameter placed at 1¼ inches centers through which the moisture pressed from the bark is removed. A hopper is provided above the plunger which permits a continuous feed into the press with each stroke of the plunger. The plunger oscillates 34 times per minute and is driven by steel gears. The press is operated by a 25 hp. motor. The outlet of

*Myers, D. M., Bulletin 1258 A. S. M. E.

the press is provided with constriction plates one on each side which can be screwed in in order to increase the pressure on the bark.

Pressing Tests

The test was divided into 3 periods, one in which the sole supply of bark was obtained from the John Edwards mill; in the second period the feed was augmented by shoveling into the conveyor thoroughly soaked bark. The conditions in the third period were the same as the second period except that the outlet from the press was not constricted. In the first period the bark was flushed onto the conveyor with a large excess of water and a considerable stream of water passed into the press with the bark. During this period the outlet to the press was not constricted. The longer time which the bark had to remain in the press apparently being sufficient to permit of satisfactory removal of the water. During the second and third periods the amount of excess water was not so great although the bark was dripping wet. In the second period the press was operated without constriction. Sufficient pressure was not obtained, however, to thoroughly remove the water at the rate at which the bark was passing through the press. By constricting the outlet as in the third period no difficulty was obtained in reducing the moisture at will.

Character of the Bark

The bark pressed was from spruce which had been stored in the mill yard approximately 2 years. The logs were floated from the wood storage to the mill and the time in the water was estimated at from 2 to 4 weeks.

Sampling for Moisture

The bark was sampled for moisture before going to the press at frequent intervals. Samples of the pressed bark were taken from each wheelbarrow load of approximately 75 lb. dry weight. All of the bark was weighed on platform scales as in the previous tests.

Data and Discussion

The following table indicates the results obtained in the tests on the Giant Nekoosa press:

	1st	2nd	3rd		4th
Percent. moisture in bark to press	75.0	72.3	73.3		74.0
Percent. moisture in bark to press	49.2	48.7	54.2	59.2	49.6
Weight of dry bark (lb.)	151	...	...	...	...
Operating time (minutes)	25	45	9	21	30
Pounds of d. b. bark per hour	362		2,980		

Further tests were made by representatives of the Fiber Making Processes Company and the three following representative tests on the American Bark Press are given:

SERIES 1

Load on bark by first press roll		3,700 lb.
Load on bark by second press roll		3,800 lb.
Apron speed in feet per minute—18½.		
Thickness of bark layer	1"	2"
Percent. moisture in bark entering press	75.7	75.7
Percent. moisture in bark leaving press	51.8	51.2

NOTE.—The apparent inconsistency of these results with those following is due to the refuse in the above tests being spruce bark only, while the refuse in the following tests contained a large percentage of slivers.

SERIES 2

Load on bark by first press roll			4,300 lb.
Load on bark by second press roll			5,700 lb.
Apron speed in feet per minute—18½.			
Thickness of bark layer	½ to 1"	1 to 1½"	1½ to 2"
Percent. moisture in bark entering press	69.5	69.5	69.5
Percent. moisture in bark leaving press	54.6	53.7	54.8

SERIES 3

Load on bark by first press roll			4,300 lb.
Load on bark by second press roll			5,100 lb.
A. Apron speed in feet per minute—18½.			
Thickness of bark layer	½ to 1"	1 to 1½"	1½ to 2"
Percent. moisture in bark entering press	69.5	69.5	69.5
Percent. moisture in bark leaving press	60.2	55.8	55.8
B. Apron speed in feet per minute—15.6.			
Thickness of bark layer	1 to 1½"	1½ to 2"	3 to 4"
Percent. moisture in bark entering press	71.0	71.0	71.0
Percent. moisture in bark leaving press	56.8	47.3	53.5

The Reduction of Broke Losses

Supplementary Report of the Sub-Committee on Waste

By H. P. Carruth, Chairman, F. J. Morrison, Robt. Herron

Broke in the paper industry is regarded as a necessary evil and for that reason many paper mill executives do not attempt to consistently analyze the causes but leave the whole problem to the operating departments. The farsighted mills, however, are continually studying this question in the attempt to reduce the amount of losses.

The control of broke losses on the paper machines is largely in the hands of the papermaker and he is the one who is mainly responsible. However, there are many other contributing factors such as the character of stock, condition and alignment of machinery, quality of felts and other things that need to be co-ordinated with the actual paper making to obtain effective results. It is in this field that the technical man can be of assistance in the reduction of broke losses.

The greatest losses from broke occur in high speed news machines, in book and writing mills that further process their product and to a lesser degree in mills making bag and wrapping papers.

Newsprint Paper

The old saying that news is made in the ground wood mill is fundamentally true. The action of the stock on the wire is influenced to a large degree by the quality and character of the ground wood pulp which represents at least 75 per cent of the furnish. For this reason most operators pay a great deal of attention to the ground wood mill in order to produce the pulp that gives best results on the wire. Many plants have reduced the freeness test to its simplest form and have an inspector on each shift making tests every half hour on the pulp from the grinders. These tests indicate whether or not the stone is making the standard pulp and if it is properly dressed. Although the freeness or slowness of ground wood is one of the important factors there are other characteristics that can be traceable, perhaps to the original wood that are not yet fully controlled.

The second step in news print control is that of consistency and percentage of ground wood to sulphite. The consistency regulator is used extensively in modern mills. One plant has a regulator on both the ground wood and sulphite supply and the mixed stock goes through another one. The first two are aids to the proper proportion of stock and the third regulates the stock to the machine chest. The slush pulp system is largely used in the big news mills and the stock is measured and mixed in tanks. Several mills use measuring tanks to obtain the proper proportion of ground wood and sulphite. A number of large news mills are using the continuous mixing system with success, thus furnishing the supply of pulp in a constant stream.

The third important step in broke reduction is in the condition and operation of the paper machines. As the mechanical condition of the machine influences its efficiency of operation it is essential to know that every part is in good running order. The tension of the wire should be carefully regulated, all wire rolls and guide rolls should be in round and alignment and all tube and carrying rolls should be correctly lubricated so they will revolve freely.

The same fundamental conditions apply to the press, dryer and

calender parts of the machine. As the old saying goes "it's a poor workman that uses poor tools" therefore it is essential to have a smoothly operating machine so that the papermaker will be able to get quality and quantity production.

Book and Writing

The control in the manufacture of book and writing papers also begins with the raw stock. The measurement of slush pulp from the bleach plant can be effected by the use of consistency regulators to keep the concentration of stock constant and proper quantities are obtained by predetermined beater measurements or measuring tanks for volume. The use of lap or dried pulp simplifies the measurement problem if the material is correctly weighed and recorded.

The character and quality of the various pulps influences the action of the stock on the wire although this is somewhat offset by the treatment of the stock in the beaters and jordans. One mill has a predetermined time of beating for each grade of furnish and another uses an indicator to keep the beater consistency constant. A mill making another grade of paper regulates the degree of jordaning by the recording ammeter chart on the motor driven jordan.

The value of keeping the paper machine in perfect mechanical condition is more important than in any other grade of paper because both quality and quantity production are essential. The engineering department should make a careful examination of the paper machine every 4 to 6 months to keep the rolls in alignment, round up any flat carrying rolls and correctly level all rolls on the fourdrinier and press parts. One mill found it very advantageous to establish a standard crown for the press rolls. The density of the rubber roll is also of importance and affects both the quality of paper and the life of the felt. The alignment, leveling and crowning of the machine calenders is also very important.

The supercalendering of book and bond paper presents another source of broke loss that must be carefully watched. One book mill reduced this loss between the winders and calenders by the adoption of standard sets of iron cores on the machine winder for various width rolls. This helped to eliminate wrinkles and permitted more complete utilization of paper on the cores. Moreover, the reduction of wrinkles reduced the calender cuts. The correct weights on the supercalenders received considerable attention and the work of smoothing the calender rolls was assigned to a special man.

Damaged paper through careless handling and faulty storage can be reduced by providing good storage facilities, adequate handling equipment and standard methods of piling.

Excessive broke in the cutter department is often due to orders that do not work out in an economical manner. This is especially true in writing book and wrapping mills. Unsuitable orders in a news mill usually mean excessive trim loss which is reflected in production.

Records of Broke Losses

Many mills have found it profitable to have inspectors to test the paper and to check the product at different stages in the operation. Such practice provides a live and usable record of quality and quantity that assists in the production of a more uniform product.

Operating records placed before the machine crews are effectively used in many mills. A standard method of computing the "machine crew efficiency" has been adapted by a majority of news print mills. Many mills post the daily figures in the machine room and some show the percentages for each tour, resulting in a great deal of competitive interest.

The following suggested form could be adapted to book wrapping and similar mills and would analyze the time and production losses on the paper machine. The section regarding supercalendering would apply only to book and writing mills. A report of this kind may be figured, daily, weekly or monthly. The assumed figures are on a monthly basis.

PAPER MACHINE OPERATING REPORT

		Hr.	Tons	%
1.	Possible operating hours	600	....	....
	Time lost due to:			
	(a) Major breakdowns	15	....	2.5
	(b) Power	9	....	1.5
	(c) Other causes	..	....	....
	(Losses usually outside the control of the machine crews)			
2.	Actual operating hours	576	....	96.0
3.	Possible production hours	..	1,728	100
	Note—Assumed capacity production of 3 tons per hour.			
	Losses due to:			
	(a) Changing felts, wires, etc	10	30	1.74
	(b) Washups	20	60	3.47
	(c) Machine broke (weighed)	..	86.4	5.0
	(Losses which can be controlled by the machine crew to a large degree)			
4.	Actual production (Machine efficiency)	..	1,551.6	89.79
5.	Possible trim	150"		
6.	Actual average trim	140		
7.	Per cent trim loss	6.67		
8.	Actual average speed	500		
9.	Actual average basis weight	50.5		
10.	Per cent over or under basis weight	1.0 over		

SUPERCALENDER OPERATING REPORT

11.	Possible production	1,551.6	100
	(a) Broke loss	40.0	2.58
12.	Actual production (Calendering efficiency)	1,511.6	97.42
	Note—Moisture loss or gain should be taken into consideration.		

REWINDER OPERATING REPORT

13.	Possible production	
	(a) broke loss	
14.	Actual production (Winder efficiency)	

CUTTER OPERATING REPORT

15.	Possible production	
	(a) Broke loss	
16.	Actual production (Cutter efficiency)	

The broke losses in the paper mill show a great variation in different plants. Figures from a large number of news print mills show a total loss of wet and dry broke ranging from 2½ per cent to 12 per cent. This figure is obtained by computing the difference between the theoretical and the actual production of each machine. A 4 per cent broke loss is considered a very good attainable figure.

The total broke losses in a book mill may vary from 15 to 30 per cent because of the several operations and 12 per cent overall loss may be considered as a possible attainable figure with good orders and operation. The losses on the paper machines, cutters and rewinders are about equally divided while the calender losses may be smaller than in any other department.

In order to bring the machine losses to the attention of both the executive and operator more strongly it is possible to translate the time lost to dollars and cents by using an average figure of operating cost per hour. The tonnage losses can be emphasized by showing what it costs to rework broke stock and reconvert it to paper.

Another effective method of illustrating the added expense due to broke is to include the figures in the cost statement as an explanatory record. The total of the conversion cost figures of the different processes indicate the wasted effort for each ton of broke and the average cost of bringing it back to the same point as good paper.

CONVERSION COST OF PAPER

PAPER MACHINES

	Tons	Cost	Cost per ton
Weight of material furnished	672		
Material shrinkage 2.5%	16.8		
Paper machine broke 8.2%	55.2		
Weight of paper made	600.0		
Total paper machine conversion cost		$13,500	$22.50

SUPERCALENDERS

	Tons
Weight of unsupercalendered paper furnished	600
Supercalender broke 4%	24
Weight of paper supercalendered	576

	Cost	Cost per ton
Total supercalender conversion cost	$3,456	$6.00
Conversion cost (machines and calenders)		$28.00

When the conversion cost alone is used it is unnecessary to consider the return value of the broke. The cost per ton indicates the average cost that is expended on each ton of broken paper as follows:

	Per ton	Total
Papermachine broke 8.2 per cent, 55.2 tons	22.50	2,242.00
Supercalender broke, 4.0 per cent, 24 tons	28.50	684.00

The average conversion value for rewinder, cutter and finishing broke can be used in the same way.

Cost Records and Broke Losses

The accompanying chart, reproduced from the Progress Report presented at Detroit, shows the method used by one concern, making a standard grade of book paper continuously, to incorporate the broke losses into the cost reports. The principal objection is that it is not adapted to an order cost system because no provision is made to credit back the broke and for this reason it shows an exaggerated figure. It does show an amount that can be termed as the indicator of increased cost due to broke. It is extremely simple, an effective figure to use in the discussion of broke losses and has been instrumental in showing results.

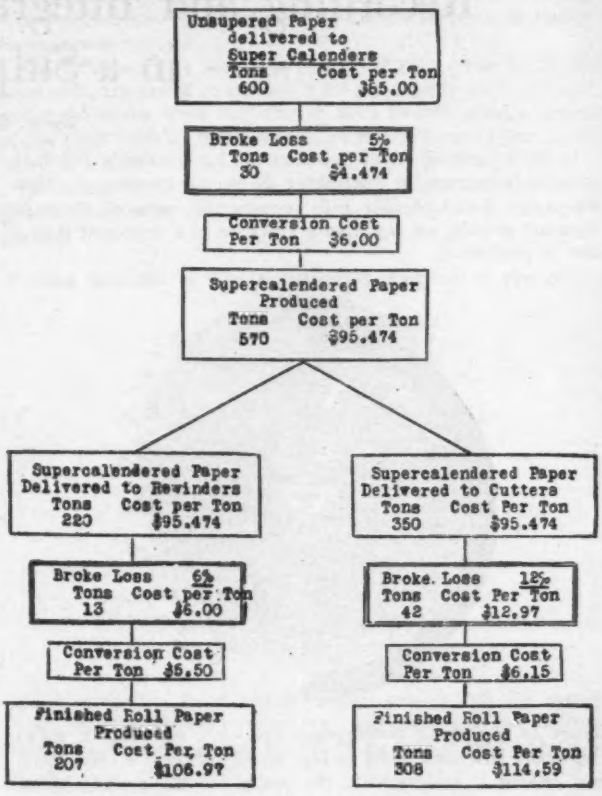
Any losses or increased cost per ton indicates a reduced return on the product that one department delivers to another, although the total cost remains the same.

Conclusions

The salient points in the problem of reducing broke losses in the paper mill may be outlined as follows:

1. It is almost universally true that the papermaker with his experience in effectively handling the equipment and stock is the most important factor in reducing broke.
2. Control of the consistency, freeness and character of stock as well as the correct furnish percentage and measurement of material are essential.
3. The mechanical condition of every integral part of the papermaking machinery is a large contributing factor in broke losses. Periodical inspection is valuable in order to keep the machinery in perfect running condition.
4. Operating records have proven very effective in many mills and when properly presented to the machine crews usually result in better quality and higher efficiency.
5. The conversion or manufacturing cost is an effective instrument to emphasize the importance of broke losses to both the operating men and the management. Interest is created and results are obtained by placing cost information in some form before the men who make the product.

Cost Chart Indicating Increased Cost Due to Broke


Unsupered Paper delivered to Super Calenders
Tons 600 Cost per Ton $85.00
Broke Loss 5%
Tons 30 Cost per Ton $4.474
Conversion Cost Per Ton $6.00
Supercalendered Paper Produced
Tons 570 Cost per Ton $95.474
Supercalendered Paper Delivered to Rewinders
Tons 220 Cost per Ton $95.474
Supercalendered Paper Delivered to Cutters
Tons 350 Cost Per Ton $95.474
Broke Loss 6%
Tons 13 Cost per Ton $6.00
Broke Loss 12%
Tons 42 Cost Per Ton $12.97
Conversion Cost Per Ton $5.50
Conversion Cost Per Ton $6.15
Finished Roll Paper Produced
Tons 207 Cost Per Ton $106.97
Finished Roll Paper Produced
Tons 308 Cost Per Ton $114.59

Report of the Committee on Coated and Processed Papers

By Edwin Sutermaster, Chairman

During the past year the Committee on Coated and Processed Papers has prepared four papers, two by Norman Clark on "Coloring Matters for Coated Paper" and "Raw Stock or Paper for Coating," one by H. H. Holden on the "Manufacture of Lake Colors" and one by J. O. Ross on "Drying and Conditioning of Coated and other Processed Papers." These papers have been preprinted and mimeograph copies have been sent to those members who would be most likely to be interested in the subjects. They will be read at the sectional meeting to be held Wednesday morning and it is hoped that there will be a large attendance and a profitable discussion.

The past work of this committee has related almost entirely to coated papers to the exclusion of those which might be included under the heading of processed. It is our belief that for the coming year our attention should be directed toward the branches of gummed, waxed and glazed papers and possibly also toward vegetable parchment making. No definite subjects to work upon have been selected and we should appreciate suggestions.

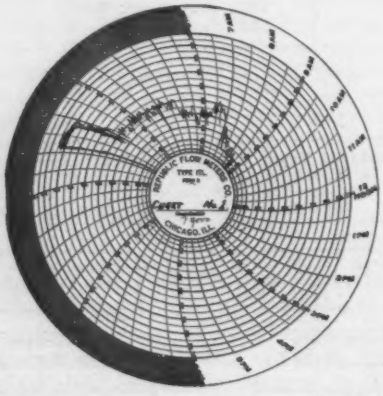
We believe that a strong effort should be made to increase the number of TAPPI members who are interested in the work of this committee, and it is hoped that widening the field of subjects covered by our papers may operate to bring in more members. In Lockwood's directory for 1923 there are listed under the heading of "Glazed Coated Paper and Board Manufacturers" sixty concerns in the United States, and less than a dozen of these are represented in the membership of the TAPPI. It seems as though we ought to do better than that and as a start in the right direction our Secretary has sent a program of the present meeting and an invitation to be present to a large number of these unrepresented concerns.

Recording and Integrating Steam Flowmeters in a Sulphite Mill

By W. H. Kraske*

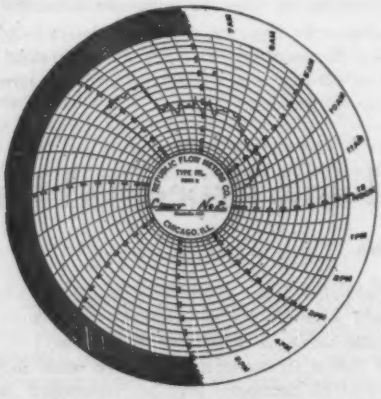
In the integrating steam flowmeter we have a simple and fairly accurate instrument for determining the pounds of steam per digester or per pound of fiber and, knowing the value of steam per thousand pounds, we can have a check on this important item of cost in production.

Not only is the steam flowmeter valuable in obtaining accurate



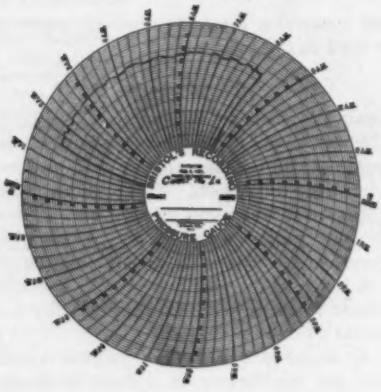
figures on the steam consumption, but when recording it shows graphically how each pound of heat unit it contains, is used, therefore making it invaluable in the control of the cooking operations.

The steam is the means of raising the liquor and chips to the temperature of digestion and creating circulation within the digester. The integrating and recording instrument will register the amount of steam used and record the rate at which it is used, making it



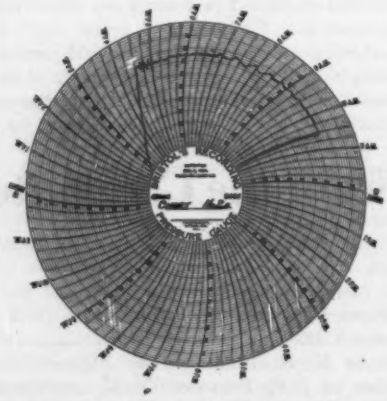
much more easily possible to maintain uniform cooking operations. If such factors as the strength and temperature of the acid, the quality of the chips, the condition and moisture content of the wood are the same, it is possible to produce a uniform fiber by following the same method for each cook by using the steam flow chart as a guide. Since steam represents money, the most practical worth of the flowmeter is probably that of determining the best quality of stock that can be produced by the use of a minimum quantity of steam.

There are many different procedures for cooking and each mill has its own, but the flowmeter will quickly determine the difference in steam consumption by the different systems and there is indeed no limit to its usefulness.



In the following investigations the steam flowmeter will show the relative value of the following:

1. Use of steam pressure regulator as against hand control of the steam.
2. High temperature as against low temperature of the cooking acid.
3. Gradual "going up to pressure" as against instantaneous method.



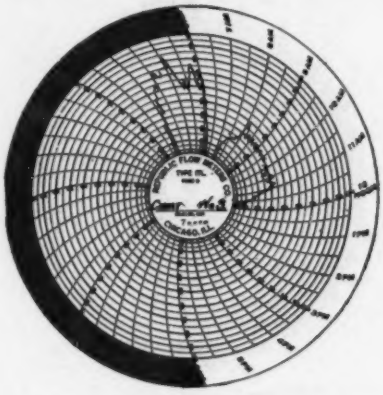
4. Running the digester straight through "on steam" as against "shutting off" for certain periods as time permits.
5. Preliminary steaming of chips.
6. Cooking green wood as compared with dry.
7. Low pressure compared with high pressure.
8. High strength of acid against low strength of acid.
9. Special methods.

The foregoing few items and the many modifications are important factors in the sulphite mill operation and the first five will be briefly touched upon in this paper.

*Memb. TAPPI. Sulphite superintendent, Consolidated Water Power & Paper Company, Wisconsin Rapids, Wis.

1. Steam Pressure Regulator vs. Hand Control

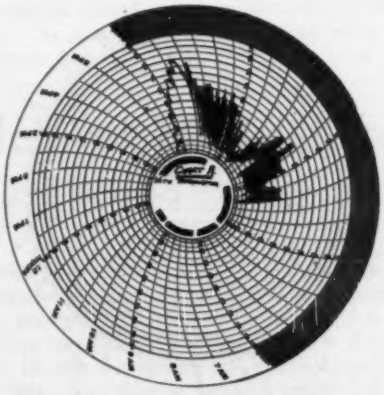
Except as a possible safety measure for the digester, better provided in other ways, the various types of regulators have been found of little value. In their operation they maintain a constant pressure within the digester but in doing so much more steam is used than is necessary. It was found under hand control, using steam when needed, the variation in the digester pressure was from 2 pounds to 5 pounds during the cook. This means but little extra stress on the digester shell and not nearly as much as the sudden surges of steam caused by the opening and closing of the steam regulator valve. This can be seen by comparison of Charts 1a and 2x. Chart 1a is the steam flow chart of digester controlled by regu-



lator, while Chart 2x is that of a hand controlled. Acid strength and temperature, grade of wood and quality of chips and the resultant pulp were the same in the two cooks.

For the operators it is true that hand control means more work but it keeps them alert and on the job and in consequence, by the cultivation of habits of closer watchfulness, a uniformly better product is assured, besides a material saving of steam for each digester.

To determine the comparative consumption of steam, a duplicate



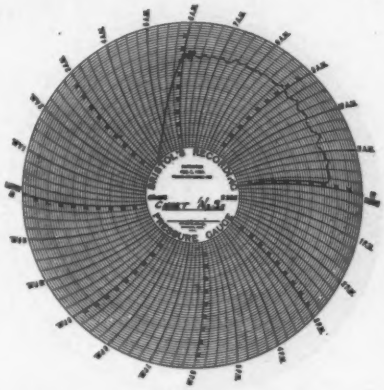
series of cooks was made using the same temperature, quality of chips and strength of acid. It was found that under hand control there was a saving of from 4,000 to 5,000 pounds of steam per digester, amounting to 6 per cent of the total. The quality of the pulp was the same in the two series, being a news grade of hemlock sulphite "very hard" by the H. Roschier test with potassium permanganate.

2. High Temperature vs. Low Temperature

It has been found by a series of tests that with each degree centigrade of increase in the temperature of the acid at the start, there was a decrease of about 1½ per cent in the steam used. In other words, a 10 ton digester used 65,000 pounds of steam when the acid was 32 degrees cent., while at 31 degrees cent., 65,780 pounds of steam was required.

The difference does not appear large but with a rise of 10 degrees cent., the saving of steam is 7,800 per digester and, especially during the winter when the boiler house is already taxed, a saving of five times 8,000, or 40,000 pounds, of steam in twenty-four hours is worth considering.

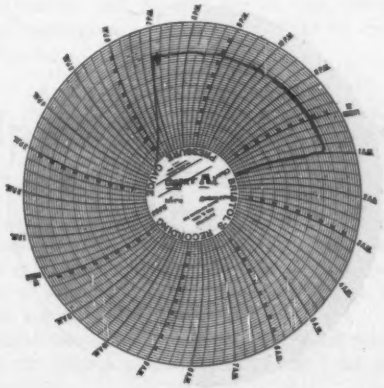
In the use of hot acid there is danger of tank deterioration, a great deal depending on the nature of the wood or other tank composition.



The writer has found that 36 degrees cent. is safe for wooden tanks, while 40 degrees cent., or over, will cause pitch to ooze from staves which would shorten the life of the acid storage tanks if of wood.

3. Gradual "Going Up to Pressure" vs. Instantaneous Method

By the term "going up to pressure" is meant the period of time taken to raise the pressure of the digester from zero to that desired, 75 pounds or better.



The accompanying charts, 1, 1a, 2, 2a, 3, 3a, show three methods of "going up to pressure" with corresponding pressure chart for the digester period. Charts 1 and 1a show a digester being brought to pressure almost instantaneously or within ten minutes. This method is used when time is an important factor and the digester must be drastically handled. In order to cook it in the least possible time all the available steam is turned on.

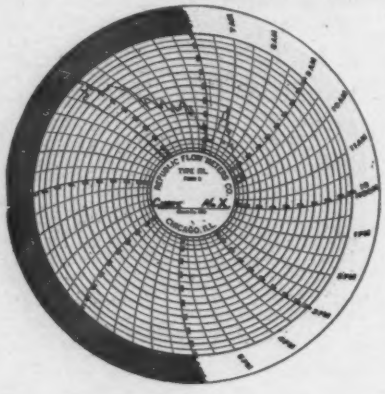
By this method, as may be seen, a great quantity of steam is used in a short time, making the load on the boiler house a very heavy one at this particular point, which may cause inconvenience

there. This fact and the drastic effect on the fiber are the chief drawbacks.

Charts 2 and 2a show a gradual "going up to pressure" by opening the valves on the steam line and using a sufficient quantity of steam to bring the digester to pressure in two hours. This method, though considerably less drastic than the first, also means a hard pull on the boiler house and is its objectionable feature.

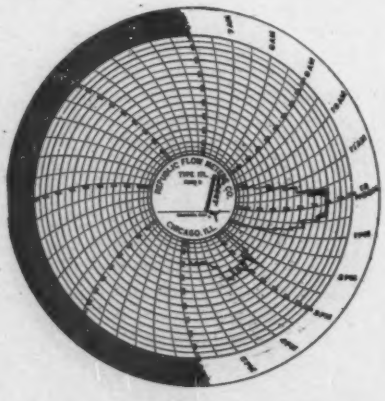
Charts 3 and 3a show a more gradual "going up to pressure" by which the steam is handled to the best advantage, using a little at a time or "stepping up" as it is called.

This method is a distinct aid to the boiler house and also results in an improvement in the quality of the stock compared with the



other methods as evidenced by close observation of the fiber produced from a number of cooks.

Of the three methods, the first is strictly an emergency one; the second is also an emergency measure, although not so drastic; while the third is the best and most practical one from the standpoints of cooking control, quality of fiber and economy of steam both in its use and its production in the boiler house. (Lundberg method.)

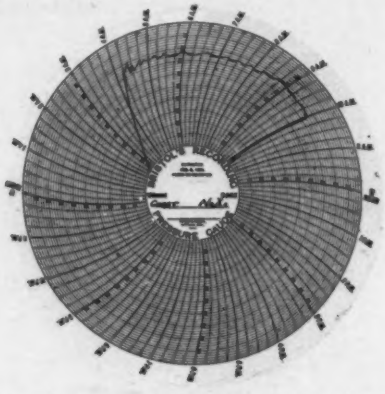


4. Running Digester "Straight Through" vs. "Shutting Off" for a Certain Period

The following comparison between these two methods is based on the time factor only. There are numerous variations which cannot be described here and many points on which comparison could be made if sufficient space were available. Charts X and Xa show a digester cooked in 7½ hours. It was brought up to pressure in 1¾ hours and the steam kept on in sufficient quantity to maintain the required temperature for the completion of the cook in the desired time. The charts show that steam was used at a somewhat higher rate during the first three or four hours in order to get the desired temperature and to complete the cook in the time available, which was from 6 to 8 hours.

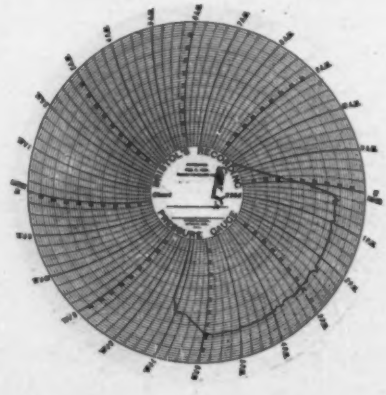
Where there was more time, 8½ hours or more, the method shown in Chart Y, Ya might be used. As may be seen in "going up to pressure" the "stepping up" system was used. Steam was used to bring the temperature slightly above the boiling point and the digest was then closed or shut for an hour or more depending on the cooking period. For an 8½ hour cook, one hour, and for one of 10 hours, a two hour "shut off" period is desirable.

Just as the boiling point is being reached the digest steam is "stepped down" while being shut off in much the same manner as in



"stepping up"; this being done to help the boiler house conditions. After the "shut off" period steam is again used but at only the rate of 60 per cent of that formerly used while it was being turned on. After the desired temperature is reached the steam is again shut off and the digester allowed to finish up on its own gas pressure.

This is a slight modification of the Lundberg system and has many desirable points while there are some drawbacks. The advantages lie in the consideration given the boiler house, the economical use of steam and the superior quality of the stock; the only drawback seems to be a slight loss of gas for the recovery system.



The stock cooked by these two methods was a news grade of hemlock sulphite termed "very hard" by the H. Roschier permanganate method of strength determination. By the method shown in Chart Xa a 10 ton digester required 73,000 pounds of steam while for that shown by Chart Y, 68,000 pounds were required, or representing a saving of about 8 per cent of the steam under the modified Lundberg method. All other factors were the

same in these two series of tests, strength and temperature of acid, moisture contained and quality of the chips, as well as steam pressure. Green frozen wood was used containing 56 per cent of moisture.

5. Preliminary Steaming

Preliminary steaming of the chips in the digester was tried on numerous occasions. The results do not show any marked improvement in the quality of the fiber or saving in steam but it may be of interest to mention some of the facts.

The procedure consisted in filling the digester with chips, turning on the steam while the chips were being thoroughly steamed, after which the bottom fitting was opened to allow the condensate to drain off completely. The acid was then pumped in and the cooking continued as in other methods.

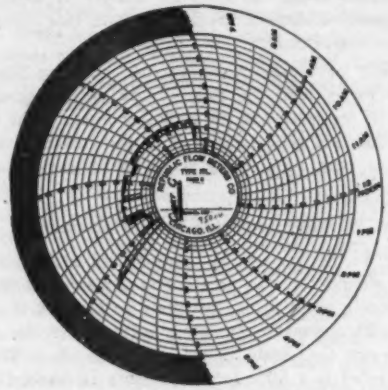
The following figures represent the steam used in the preliminary treatment:

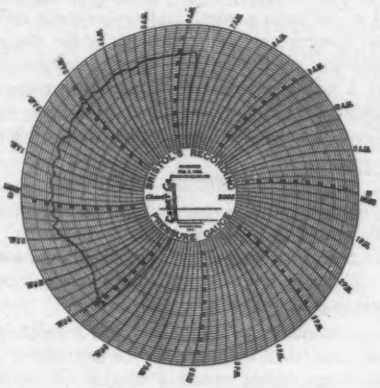
Per cent of total steam used	Pounds of steam	Volume of condensate
5	3,200	None
10	6,800	Very little
16⅔	11,000	730 gal.
20	13,500	1,200 gal.

The condensate was of a dark brown color up to the 16⅔ per cent figure. As greater quantities of steam were used the condensate became lighter in color. This color may be due to the liquor from a previous cook washed from the lining as well as the material distilled from the wood. (No difference in fiber quality was noticeable in any of these tests and the lost time is probably of more value than any possible improvement in quality or saving in steam.)

Special

That the recording flowmeter instantly detects any irregularities in the use of steam is evidenced by a glance at Charts C, Ca, flowmeter and pressure charts of the same cook. In this instance, the working parts of the check valve in the main steam line of the digest broke loose and became lodged in the steam passage, practically shutting off the admission of steam. The flowmeter immediately showed the result in the chart, whereas the digest pressure gauge did not show that anything was wrong until twenty minutes later.





The flowmeter chart enabled the operator to save considerable time and worry by being able to locate the difficulty at once; the cooking was finished without loss of time by the use of an auxiliary steam line.

Poor circulation within the digest could, in most cases, be detected, but I have no charts to show it.

The cost data on steam for tower jets, for that used in the coils of sulphur melters and for mill heating, can also be obtained at very small expense since meters can easily be moved from one place to another.

Help of Flowmeters in the Sulphite Cooking Process

By Halvar Lundberg*

How can a flowmeter be of any help in the cooking of sulphite pulp?

Many mills have at the present time installed separate flowmeters on each digester and are taking a reading of the steam consumption either per twenty-four hours or per cook, and I am sure many a superintendent has noticed the big variation in steam consumption from cook to cook but without giving any deeper thought to the question, "Why does this big variation occur?" I have in many cases noticed a variation as high as 40 per cent in the steam consumption.

Quick Cook Process Only Considered

In this particular article I am only going to consider the quick cook process as it is by this method—where the steam comes into direct contact with the chips and later with the fiber—that we have to use the utmost care when using the steam.

The steam is used in the quick cook method both as a source of heat and for maintaining proper circulation in the digester.

We need a certain temperature for bringing about the reactions necessary to dissolve the non-fibrous matter in the wood, and when this point is reached, a good circulation, without which it is impossible to get an uniform product.

I have also found that control of the steam is necessary for keeping down the sulphur consumption, a point I am going to discuss further later on.

Thus steam is necessary for different purposes and the greater part of it is used for bringing the digester up to desired temperature.

Steam entering a digester is being condensed at the same time it is giving up its heat. We have therefore to figure with a continual dilution of the acid as long as the steam valve is open. At the same time, to permit the admission of the steam, we are forced to relieve the digester, and relieving is the same as robbing the digester of the sulphur dioxide. If we ar not, therefore, careful about our initial temperature; that is, the temperature of the acid and chips, we shall sometimes come into very serious difficulties.

*Junior Member, TAPPI; Fraser Companies, Ltd., Edmunston, N. B.

I am sure every sulphite superintendent has noticed trouble with his pulp at the beginning of cold weather, and I blame most of it to neglect of the temperature of the cooking acid. We must remember that even a difference of 10 degrees fahr. of the cooking acid represents a difference of about 200 pounds of steam or more per ton of air dry pulp.

Knowledge of Chemical Reactions Limited

Our knowledge of the chemical reactions which are taking place during different stages of the cooking process, is very limited, while we find almost as many cooking methods as there are sulphite mills. This lack of knowledge has brought about a further evolution of control of physical conditions, as we have found, that if we can keep the acid at the same strength and temperature, use chips of the same size and moisture content and work under the same temperature and pressure conditions, with control of the steam we are bound to get a uniform pulp. It is therefore necessary that we should, by continual tests and analyses, follow these conditions and try to keep them as much alike as possible from cook to cook.

Use of Recording Instruments

For these reasons most of our mills now have their digesters equipped with recording instruments for pressure and temperature and automatic regulating valves for keeping a constant pressure in the digester. There is, however, still much more to be done along the line of utilizing the steam to the best effect.

"If I don't get steam, I can't make pulp," is a standing expression, and it is quite true, that we must not be careless in its use. As we have seen before, steam causes a dilution of the acid. If we, therfore, at one time are carelessly using 40 per cent more steam than another time, we can see the impossibility under such conditions of controlling the cooking process, and the product cannot be as uniform as desired.

I therefore strongly recommend the installation and use of separate flowmeters for each digester.

Another Advantage of Flowmeters

Another advantage of flowmeters is that they indicate if the cook is exactly following given instructions. Supposing the pulp is not up to desired quality and you want to make a change in your cooking method. The change is usually not so great that you can notice any difference in temperature and pressure. How will you be able to give definite instructions to be followed without flowmeters? With help of flowmeters you can do so and every minute see for yourself if the right thing is being done or not.

An old sulphite cook told me not long ago his opinion about the flowmeters, saying: "With one of those flowmeters a baby can start cooking pulp without one day's practice by only following given instructions." This shows best the possibilities in the use of flowmeters.

Uniform Steaming

One very often hears old cooks saying that they never steam two digesters alike. They seem to be proud of it, but in my opinion the uniform steaming of the digester is the most important thing in the sulphite cooking process for getting a first-class, uniform product.

For my part I never allow the steam valve to be opened too much at the start of the cook but the steam given is increased in amount successively every tenth or fifteenth minute until the valve is full open after one to one and a half hours. Going too fast at the beginning the digester is likely to be bored, but by using the slow starting method, I am only helping the boiler house but I am more sure of getting a good circulation in the digester. It is, however, not to be taken as a certainty, as the digester can be bored even now and the usual care must also be taken.

No Difficulties in Fixing Amount of Steam

With the use of the flowmeter there are no difficulties in fixing the amount of steam that is to be added at each interval. We can thus steam the digester in the same way, cook after cook, which, as I said before, is very important for getting a uniform quality of pulp.

A certain minimum temperature is necessary in the digester before the chemical reaction begin. It is therefore important that we keep track of this minimum temperature and always try to reach the same after a certain fixed period. The flowmeter helps us with that. If we have a steady steam pressure, a certain amount of steam always correspond to a definite amount of heat units. This if, we, cook after cook, add a certain amount of steam, we supply the same quantity of heat to the digester each time, providing other conditions are the same.

The amount of steam necessary for reaching this minimum temperature varies with the time of the year, depending on the temperature of the wood and the radiation losses. The temperature of the acid does not need to vary if proper control is kept as it is easily checked with the cooling water and the cook ought to be responsible therefor.

A Point Requiring Careful Attention

Depending on the size of the digester and cooking time desired the digester should come to pressure in a maximum time of three hours. This is a point to pay attention to because, if the digester is equipped with automatic regulating valves, when the digester has reached pressure the steam is entirely shut off. The time for starting the relief is a little before pressure is reached to secure a uniform steam flow, remembering that the digester has not yet been uniformly heated, while entirely closing of the steam valve and afterwards opening it wide can at this time also cause a boring of the digester. The flowmeter helps us to detect this point, and if the cook is watching his digesters closely there is no reason for a cut off in the steam flow.

The above mentioned minimum temperature ought to be reached after five hours and the integrater on the flowmeter tells us when enough steam has been added for reaching this point. Now the digester is either shut in for a certain period or the steam valve partially closed only admitting a certain amount of steam, depending on quality and cooking time desired. The shutting in of the digester gives a bigger saving in steam and is mostly preferred.

Temperature Control

If the temperature in the digester is raised a little above this minimum temperature, the cook can be finished up without adding any more steam and by slowly relieving. I have made several cooks giving steam for four and a half hours and finished them up after eight and a half to nine hours total cooking time, and got a very uniform pulp. However, although the blowing test was lower than customary, we remarked a gradual increase in the sulphur consumption. This is a very interesting circumstance, which I think ought to be more studied. However, it shows that steam has to be used towards the end for driving out the sulphur dioxide which otherwise seems to form some chemical compounds with the non-fibrous matters, getting lost in the waste liquor.

Steam Control

The steam necessary for this purpose should, however, be kept down to the lowest possible amount but has to enter the digester uniformly. A small amount of steam uniformly entering a digester gives more service than a greater quantity added non-uniformly, and it is here during the later part of the cooking that a considerable saving can be made in the steam consumption. I go further to say that most of our mills can lower their steam consumption five to ten per cent by only checking this part of the cook, and I can almost guarantee a more uniform pulp and higher yield per digester.

Heat Transference in the Ventilation of Machine Rooms

By J. O. Ross*

The subject of this paper has a rather formidable sound and until a few years ago would have had no place in any discussion in mill ventilation. For a good many years, however, it has been recognized that the amount of vapor rising from a paper machine had a very decided influence on the proper heating and ventilation of a machine room.

From the very earliest days it was well recognized that this vapor must be removed from the room, which was usually accomplished by allowing it to escape through openings in the roof and that was about all that machine room ventilation amounted to. It followed as a matter of course that in most machine rooms hoods were provided over the paper machines and they were generally considered necessary.

Efficiency of Vapor Removal

It was not recognized that air had to enter the machine room in exact proportion to the amount removed. There wasn't very much thought paid, however, to the air entering but nature was allowed to take its course and it was assumed that the air got in somehow. Every different arrangement of a mill had something to do with the efficiency of the vapor removal. If there was a number of buildings connected with the machine room from which air was available, the results were satisfactory. If the machine room was exposed it was found in cold weather that drafts came in around the doors and the windows causing fog. The natural thing to do, therefore, was to close up such openings and prevent the cold air entering. It was generally noted that the production was lowered during the winter, a condition which was recognized as unfortunate but for which there was no remedy.

Even with air coming from other departments of the mill and the external openings pretty well closed up, condensation on the ceiling was frequently experienced and steam pipes were strung along the roof to keep it warm and prevent the condensation. Hoods built of wood were usually built over the paper machines connected with ventilator stacks in the roof, sometimes equipped with exhaust fans. The hood was made large enough to cover the machine and the size of the vent stacks or fans was determined pretty much from the size that had been used in some other mill of about the same size. If an exhaust fan was put in and after running a while it was found that the roof still dripped it was considered a pretty good sign that the exhaust fan was not large enough, and another was put in, of greater capacity.

The amount of steam pipes used on the roof depended a lot on the judgment of the superintendent. The arrangement was a steam pipe in every bay or rows of pipes twelve inches apart, or eighteen inches apart, or twenty-four inches apart, depending on what would present a good appearance. That was pretty much the machine room ventilating system in the early days.

It was later found that if warm air was blown along the roof of the machine room the results were better than with steam pipes and was an especial improvement in a machine room which was not connected with other departments from which to draw air but where the air had to come in from outdoors, and it was now found that the production was nearly as good in the winter as in the summer. This seemed like a great improvement and of course the more air that was blown in the less chance there was of condensation on the roof and wall interior.

Agitation Does Away with Removal of Hoods

There then followed an agitation to do away with the hoods over the paper machine. With the installation of a hot air system everything seemed dry in the room. Then someone had to take off the hood to replace it with a new one and found the roof did not drip. This seemed a wonderful thing and showed that hoods were not needed. Every papermaker was glad to do away with the hood because it was dirty, blocked the light, was a fire menace and generally an all around nuisance. Once in a while after a hood had been removed drip occurred. This was not regarded as a reflection against the ventilating system but simply proved (so it seemed) that in this particular mill the machine needed a hood. If, however, the opposition to hoods was strong the solution was found to be simple. Blow in a lot more hot air and the roof would not drip. Sometimes in considering a hot air installation for a mill the chief engineer or superintendent would want to know how much steam was needed for the hot air system. When he was told, it didn't seem possible that any system could take so much steam. The contractor supplying the hot air system would faithfully maintain that it was worth that much to the mill because it would keep the roof dry and result in greater production than usual during the cold weather. The paper mill man would add this amount of steam to what was being used on the machine and would say the extra production was not worth it. Neither realized that they were both wrong. The actual facts probably were that no greater quantity of hot air nor any hotter air was going out of the roof ventilators after the system was put in than before, and consequently the paper mill was not using a pound more steam afterwards than before.

In the desire to insure having a dry machine room, however, air in greater and greater quantity was calculated. Sometimes guarantees would be made that the roof would not drip but nobody guaranteed that the coal pile would not be reduced at a specified rate. Naturally as time went on more knowledge was obtained as to how to calculate the amount of air required but this calculation was based mostly on changing the air in a machine room in a specified time. A five-minute air change was considered a fine system. A ten-minute air change was thought not so good, while a fifteen-minute air change requiring less equipment was cheaper and regarded as a pretty poor system.

With the development of the industry came an increase in the capacity of paper machines. The same room which had held a machine making twenty tons per day now held a forty-ton machine and all the figures as to air change were wrong. New ventilating systems put in new machine rooms figured about the same size as some former installation did not seem to give satisfaction. Rooms which formerly had been dry began to drip once more and hoods began to go back on the machines, not for the sake of economy but to protect the machine from the drip.

Changing Conditions

It will perhaps best be understood why these changing conditions continued when it is remembered that ventilation of the machine room was not a matter to cause the paper mill engineer a great deal of thought. He had more vital things to consider, mostly in regard to the machinery for making paper, and the heating and ventilation were left to the heating contractors. A heating contractor handled the heating for all kinds of buildings and seldom would the same man have more than two paper mills to figure on during his business life. Not having time to investigate and study the conditions he necessarily went mostly by what had been done before.

With the general advance in engineering knowledge of paper mill conditions, not only in regard to the papermaking machinery and the power plants but also general plant efficiency, there now came a realization that the ventilation of the machine room was really

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an important engineering matter. Roof construction began to be studied with a view to making the roof more efficient for paper mill conditions. It was beginning to be realized that the machine room was not simply a building, but essentially a part of a machine, being really part of the papermaking machine, and another important part being the ventilating system. It then began to be realized that all the heated air which passed out of machine rooms was heated by steam somewhere in the mill and that it did not matter whether it was heated in a definite way by special apparatus or heated in the different departments from which it was being drawn or took the heat from the driers or somewhere else; it was being heated somewhere in the mill and the mill had to bear the cost for heating it. It was the realization of this fact the writer feels has been responsible for all the advances in the science of machine room ventilation, that have been made.

The Ideal Condition

The ideal condition from the standpoint of efficiency is to have the air leaving the machine room in a saturated condition. At this it would mean that every pound of air was doing its best work, but unfortunately a condition which would give trouble due to condensation, as only a very slight drop in temperature would cause the moisture to condense. The nearer, however, this point can be practically reached without danger of condensation the better. On examination it has been found that many machine rooms had a ventilating system which was decidedly inefficient. The room might have been perfectly dry, without any drip or condensation, but the air was passing out of the ventilators in a condition very far from saturated. This meant that a far greater quantity of air had to pass out of the roof ventilators, representing a vast waste of heat. When this point was fully realized it began to be quite apparent that the ventilation had a great deal to do with steam economy in the plant. It was found that where a machine was provided with a hood, it enabled the air to pass out of the ventilators at a higher degree of saturation than if it were not hooded. This meant that less air passed through the machine room and consequently less air was heated. It therefore became apparent that a hood had some other purpose to serve besides protecting the machine from drip of condensation and a good many hoods have begun to make their appearance on the machines once more following an intelligent study of the air conditions of the mill and the moisture to be carried away.

The air may pass out containing from 10 per cent to 30 per cent more moisture which means that from 10 per cent to 30 per cent less air is required to be heated. With the return of hoods has come a demand for one of better design and construction. A hood is now considered as a machine which returns a certain amount on the investment, as it saves steam which saving can be applied towards paying for it. A new fireproof type of hood has been developed, built of steel frame with asbestos board covered with gypsum. It can easily be kept clean, does not deteriorate, and is an improvement in the appearance of the room. The heat is retained so that the air does not cool down before passing out of the ventilator, the result being that much more highly saturated air can be handled than in any other way.

Proper Method of Introducing Air

It will be noted that the development thus far has been along the lines entirely of cutting down the amount of air which has to be heated to the minimum and a saving on heat in this air and then discharging to the atmosphere only the amount necessary to carry away the vapor. The amount of air passing out of the roof ventilators must be heated somewhere and should be heated in a definite manner and introduced into the room in a definite way. It has come to be a pretty well accepted that the forced circulation of warm air into a machine room is the proper method of introducing it. The air is heated to the desired temperature usually by steam pipes and then discharged into the room by means of fans through ducts. With the realization that steam was being used to heat it has come the realization that this air should be applied in the most efficient manner. Sufficient air should be discharged along the roof to keep it dry and warm, but an excess amount should not be applied in this way. A vapor absorption system has been designed for the driers of the paper machine. This is a system whereby instead of blowing all the hot air along the roof, air is introduced into the vapor pockets formed by the driers on the paper machine to absorb the vapor as fast as the moisture leaves the sheet of paper. Up to date this system has been applied mostly to machines not provided with drier felts or at least to those with drier felts only on the bottom because drier felts interfere with getting the nozzle pipes through the vapor pockets. Where this can be done, however, a great saving is secured. The air discharged into the vapor pockets greatly increases the drying efficiency of the surface of the driers by removing the damp vapor contained in these pockets. As it has been previously stated, a certain amount of air must be passed through the machine room in order to carry away the vapor produced in drying, and it will be apparent that no more air need be applied to the driers than if it were all blown along the roof. Therefore all the extra work that this air has accomplished on the machine by increasing its drying capacity, and thereby increasing the efficiency of the driers by removing the vapor as it is produced, is all a gain with no extra expense. It is safe to say that wherever possible air should be introduced in and around the machine only discharging enough air along the roof to keep the roof free from condensation.

Open Pit Becoming More Common

On paper machines which have drier felts top and bottom, or for any other reason where it is not advisable to introduce the air into the vapor pockets of the machine, the air is often discharged in considerable part into the pit under the machine. It has lately been realized that circulation of air through the pit not only greatly increases the life of the drier felt but also greatly assists in the removal of moisture from around the machine and the consequent efficiency of the drier section. The open pit is becoming more and more common where air from the basement is allowed to pass up through the pit and out through the machine ventilators. Many variations of application are possible but the writer believes that the more direct the application of air to the machine driers, the better. If it is desired to blow air along the roof, and in nearly every case a certain amount should be handled in this way, attention should be paid to the method of introducing this air. The amount of air to be applied in this way is largely determined by the design of roof and how much heat will be lost through it by radiation. More attention is being paid to the roof insulation with the result that less air need be blown along it to keep it dry. The writer would again emphasize, however, that this has nothing to do with the amount of air that must be introduced into the room as that is entirely dependent on the amount of vapor being produced. It does mean that more air is available for the machine or use in the pit. The beam construction of the roof, the direction in which the purlins run, the depth of the purlins or beams, have a great deal to do with the details of the proper distribution of the air. Generally speaking the more uniform the distribution of the air over the surface of the roof the better. There are some cases, however, where the air need not be very evenly distributed and in such instances a self contained unit usually called a unit heater is employed. These unit heaters are manufactured by most blower companies and in general consist of a fan and steam coils in one self contained casing, with comparatively short pipes leading from the outlets of the casing to distribute the air. It should always be borne in mind, however, that it is not well to blow too much air on one part of the roof as the danger is that a portion of it will short circuit to the ventilators without being properly saturated representing a loss in steam. Local conditions will determine to a great extent the proper method of distribution.

Utilizing Heat Passing Out

We now come to the next important phase of this problem which is the utilization as much as possible of the heat in the air passing out of the roof carrying the moisture vapor. There is perhaps no source of waste heat that has troubled the conscience of the thoughtful paper mill engineer and superintendent more than the great loss of hot air and vapor continually escaping from a machine room into the outside atmosphere. Without even calculating it, it is evidently very great, as anyone who has been anywhere near one of these ventilators on a machine room roof can testify. It is only very recently, however, that any definite move has been made commercially to recover this heat.

Waste Recovery

When it is considered that nearly two-thirds of the steam which is used on the driers of a paper machine is used only for the purpose of turning the water into vapor it will be clearly understood that if this vapor could be condensed back into water the same heat could be recovered. The terrific amount of heat in this waste vapor can perhaps best be illustrated by one or two definite figures. On a news machine making 90 tons of paper per day, it was found that the vapor and hot air was passing out of the ventilators at a temperature of 115 degrees Fahrenheit. When this vapor was cooled down to only 87 degrees it was found that the heat recovered would be equivalent to approximately 10,000 pounds of steam per hour. That gives a pretty fair idea of the amount of heat which the average paper mill is throwing to the atmosphere.

Two Methods of Heat Recovery

There are two commercial ways that this heat can be recovered. There is an economizer method whereby this heat is used to heat the fresh air to be distributed to the machine room. The vapor is drawn through this economizer and passes through a series of channels. The colder fresh air entering the ventilating system is drawn through another series of channels of the economizer and the cool air absorbs the heat from the hot vapor-laden air, causing the moisture to condense to water, this water being removed from the bottom of the apparatus. Several of these economizers are now in use and it has been found that it is possible to heat the air entering the machine room to a temperature of from 80 degrees to 90 degrees only by the use of the waste heat ordinarily passing out of the roof. Where the weather is colder, especially in the northern mills, the heat recovery is still greater. The enormous amount of steam saved by this method is quite apparent.

The other method of utilizing this waste heat is to use it to heat water directly by passing the vapor through a water spray. In boxboard mills this method may be utilized for heating water required for the beaters. It is usually to find that this water is not fit for boiler feed water, due to contamination, but is excellent for beaters or any other uses around the mill. It will be understood that it is not possible to heat water to a high degree with this vapor, as the limiting factor is the temperature of the vapor. In tests which have been made, however, a large volume of water has been heated from 40 degrees to 104 degrees by use of waste vapor only. These are the latest steps in the economical ventilation of a machine room.

Must Discontinue Throwing Heat Away

The time is here when no first-class mill can afford to go on throwing heat to the atmosphere and at the same time using enormous quantities of steam to heat other air coming in to take its place. The most serious feature of this condition is the maximum load on the steam plant for the ventilating system comes during the extremely cold weather just when the heaviest load occurs in the steam plant for other purposes. To anyone who has not stopped to make calculations it will be a revelation to take the quantity and the temperature of the air passing out of the ventilators and determine the amount of steam that has been used somewhere in the mill to supply that quantity of heat.

Too Much Ventilation

The ventilating engineer and the paper mill owner today should not fear to face the matter squarely to realize that, as he must heat a large amount of air, he may as well do it definitely, knowing fully just where it is to be used, and determine that he will not heat more air than is necessary, that he will not heat it higher than necessary, and that he will heat it as far as possible by utilizing a source of heat which has been wasted in the past. The cost of ventilating the machine room is one of the costs of doing business and as long as it is kept to the smallest amount possible it must be faced. The difference in the cost of operating a system which does not keep the machine room free of condensation compared to one that does so and does it economically, is so slight that it is not worth considering.

Report of the Joint Felt Committee

By George H. Harvey, Chairman

Your committee begs to report that it has had several very interesting meetings and that all of the members have met with splendid co-operation in their efforts to gather information regarding the manufacture and use of papermaking felts.

One of the first things undertaken was the preparation of a uniform data sheet on which could be listed valuable information regarding the paper machines. With the help of these data sheets it is possible to analyze the abrasive action and other effects of suction rolls on the felt as well as to study the effects of suction boxes, whippers, guide and spread rolls and other appliances.

Data Sheet

With very few exceptions, the paper mills throughout the country recognizes the value of this data sheet and a great number of them are co-operating with the Felt Committee by supplying the felt manufacturers with the information called for.

The use of this data sheet may not produce immediate and startling results, but the committee believes that continued work in this line will eventually prove it to be a forward step. The data already in the hands of the felt manufacturers are assisting them greatly in making more reliable felts better designed to meet the conditions imposed upon them.

Some of the felt manufacturers are spending a great deal of money in their research work on the factors influencing the life of a felt. They are making a critical study of the processes of manufacture and of the materials used in an effort to produce a felt that will remove the greatest amount of water from the paper without causing marking, crushing or blowing.

Felt Stresses

Considerable work is also being done in the investigation of felt stresses while running on cylinder paper machines. Methods of washing and cleaning felts while on or off of the machine, as well as the care of felts in storage are also being given attention.

The results of all this work will be given to the general trade as soon as it is possible to do so, and we believe that every mill using felts is now deriving some benefit from what has already been done.

Raw Stock or Paper for Coating

By Norman Clark*

This report is presented as a contribution from the Committee on Coated and Processed Papers. It is not to be considered as final, but is more in the nature of a start toward the standardization of one of the important raw materials of the coated paper industry. It is hoped to add to this report from time to time, and to make such changes as are justified by improved methods of testing and a more complete knowledge of the requirements of paper for coating.

It is quite certain that there will be many differences of opinion on this subject and since it has proved impossible to collect and tabulate them all it may be well to state that those given have been taken from the experiences of the writer while associated with three of the coating mills in the east, and that they have been supplemented by a few notes and observations from the other members of the committee.

Before taking up the subject of the properties of the individual papers, it would be well to go into the matter of the general characteristics which all coating sheets, colored or white, should possess.

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1—Formation

It can be said almost as a truism that all sheets intended for coating purposes should be as uniformly closed up as possible under the conditions of the prescribed furnish. A sheet tending to be wild does not coat well because there is not even absorption of the coating over the sheet. Again, a wild sheet presents a disagreeably mottled appearance if finished at all high, whether on the stack or friction. This wild and bunchy paper is especially undesirable for high grade book paper, as the mottled appearance not only shows in the finished sheet but is very noticeable in printing half tones or solid blacks because of the uneven absorption of the printing ink.

2—Dirt

Under this head comes dirt specks, shives and rosin and lime spots. Whatever the character of the spot, it should not be present because it is not true that a coating covers up everything; it does cover a multitude of sins, but not all, and spots showing through the coating or causing a local thickening or thinning of the coat make an inferior job. It is frequently found that the heavy calen-

Grade	Ream weight	Furnish Per cent	Bursting strength points	Sizing	Uses
Friction and Flints	20 × 24 — 17	30 Sulphite to 50/50 70 Ground wood 30 Soda 70 Sulphite	10 to 15	Medium	Box covering.
Plate	20 × 24 — 17 to 50 and specials	30 Soda 70 Sulphite	12 to 35	Soft	Labels, box covering, signs, kindergarten supplies.
Book	25 × 38 — 40 to 80	40 Soda 60 Sulphite	10 to 20	Soft	Printed work.
Dial†	22 × 28 — 70 to 160	20 Soda 80 Sulphite	50 to 80	Hard	Clock and watch faces.
Playing Card	22 × 28 — 45 to 115	30 Soda 70 Sulphite	20 to 50	Hard	
Litho	25 × 38 — 35 to 90	20 Soda 70 Sulphite 10 Esparto or Rag	15 to 40	Hard	Lithograph work.
Boxboard	0.011 to 0.032	Manila Liners with softer middle. Manila should be fairly long to give folding properties.	40 to 70	Medium	Boxes.
Enamel†	25 × 38 — 35 to 125	30 Soda 70 Sulphite	15 to 60	Medium	Box covering, illustrations.
Translucent‡	25 × 38 — 110 to 150	15 Rag 15 Soda 70 Sulphite	50 to 70	Medium	Embossed work, lithography.
Proving Plate†	22 × 28 — 50 to 80	40 Rag 15 Soda 45 Sulphite	15 to 30	Medium	Lithography.
Tablet	22 × 28 — 50 to 80	30 Soda 70 Sulphite	15 to 25	Medium	Pads.
	22 × 28 — 50 to 120	Manila (long for folding)	30 to 70	Medium	
Label	20 × 24 — 17 to 50	50 Ground wood 50 Sulphite	10 to 20	Hard	Printed labels.
		60 Sulphite 40 Soda			
Enamel, blotting	22 × 28 — 90 to 180	100 rag		Hard 1/S	
Metals	20 × 24 — 12 to 50	Glassine Manila Greaseproof Kraft Ground wood or Free sheet		Medium	
Micas	20 × 24 — 20 to 28	High Soda to give bulky sheet		Soft	Fancy box coverings.
Waterproof	20 × 24 — 20 to 35	100 Sulphite 45 Sulphite 55 Ground wood 25 Rag 15 Soda 35 Sulphite 25 Ground wood	10 to 30	Medium	Waterproof box coverings.

†Grades thus marked very particular as to color.
‡Capable of standing embossing.

dering given the coated product makes the dirt and shives more noticeable than they were in the uncoated paper. This matter of cleanliness is imperative in a fine white sheet intended for Dial, Litho, Enamel, Proving Plate or Translucent, while the question of shive is of particular importance in a high percentage ground wood sheet. The known affinity of ground wood for dyestuffs produces, if shives be present in any quantity, a sheet mottled with the more darkly colored particles of shive.

3—Color

As a general rule the color of the sheet should be as good as possible, for the better the color of the raw stock, the better that of the finished coating. The nearer the color of the raw stock comes to that desired in the finished paper the better, for under such conditions streaky coating, brush marks and poor spreading of the coating are not nearly so noticeable as they are if there is a great color difference between the paper and the coating applied.

Many coating manufacturers have a preference for a certain tint of white, and this desire must be taken into account by the makers of the paper. Whatever the tint desired it is imperative that shipments should be uniform throughout. Unfortunately this is often not the case and it is common for a shipment to have to be divided into two parts before coating. The writer has even seen a single lot of paper which had to be separated into three parts because of differences in color.

4—Slack Edges

In running a coated sheet from the coating machine to the cutter, it is necessary that the tension be uniform. This is a very difficult task where there are slack edges and is besides productive of much waste due to break and cuts.

5—Thickness

In order to get a uniform coat the sheet must be of uniform thickness. This is of course more apt to vary on a heavier than a lighter weight. If one edge of the sheet is thinner than the other then it will take on more color and so present a difference, side to side, of the coated sheet.

6—Fuzz

Fuzz on a sheet is very objectionable, not only to the coating man but to the user of coated paper, the printer. To the coating man fuzz gives trouble in local coloring of brushed-up fibers, or difficulty in getting finish desired. To the printer or lithographer it is a constant source of trouble adhering to his plates and causing a smearing of the ink.

7—Finish

The coating man requires a certain amount of finish, depending on the purpose for which the sheet is intended but, in general, the highly finished sheet is not desired. Just enough to even off the surface of the sheet is all that is required except for special lines. Of extreme importance is that the finish be uniform across the sheet to insure uniform brushing on the color.

8—Curling

Very often rolls are received which will curl badly on one edge on drying on the lines. This causes waste and delay on the reels.

9—Feel

The "feel" of a sheet of paper is something which our technical language is inadequate to express except in very general terms. Probably the best that can be done along this line is to say that it should be velvety or leathery in feel, and that it should not be dry, harsh or brittle when crumpled. It should bulk well, and these properties can be attained by getting the formation close and not forgetting the soda pulp.

Closely associated with the feel of the paper is its tear. This can now be measured and recorded by a number of instruments but sufficient data are not available to permit of standardizing this factor. Great difference of opinion exists as to the properties desired in the tear; some prefer it short and clean while others want a long fibered tear with considerable "hang-on" and a tendency for the paper to split.

Appended is a table showing under each grade of coating the Weight, Furnish Strength and Relative Sizing of the papers required for each purpose. A final column showing the uses of the finished papers has also been added. There will probably be exceptions taken and a certain amount of lack of agreement here depending on the usage in various mills.

The sizing was determined by the cell method using 100 ohms resistance. The following values were taken:

Soft — Up to one minute
Medium — One minute to three minutes
Hard — Above three minutes

Drying and Conditioning of Coated and Other Papers

By J. O. Ross*

The drying of paper is quite intimately concerned with its conditioning and the two are so closely related that it is very often that one process merges into the other. The different classes of processed papers that have to be dried include coated paper, which in its turn includes book paper, lithograph paper, coated boxboard, glazed paper, water proof papers and similar classes; second, wall paper; third, gum paper; and fourth, sand paper.

Two Main Classes

The drying of coated paper is roughly divided into two main classes, single-coated and double-coated. This refers not to the number of coats per side but to distinguish between paper coated on one side and paper coated on two sides. Paper coated on two sides may be made as single-coated paper. That is it may be run through coated on one side, dried, returned to the machine, coated on the other side and again dried. A variation is with the so-called tandem machine whereby the paper is first coated on one side, partially or completely dried, then receives a coating on the other side after which it is completely dried. For all general purposes, however, by both methods the paper is treated the same as single-coated papers. We will first take up the drying of the single-coated sheet.

The width of the sheet coated may vary from 30 inches or even narrower, up to any width desirable or possible to operate on a coating machine. The writer believes that the gradual tendency will be towards wider coating machines. Seventy-two inches seem to be a popular limit in width at the present time on book and lithograph papers. Machines are now being built a foot wider than this and coating machines have been constructed as wide as 96 inches in width, so far, however, being used on coated board. The writer's opinion is that the only limiting factor on the width of the coated sheet is the handling of the raw stock, the finishing in the calenders and the market requirements for particular grades of stock. The speed of the coating machines is also variable, the limit of which the writer does not believe has yet been even approached.

Maximum Speed

A proper drying system for coated paper should be sufficient to dry the paper thoroughly and properly at the maximum speed at which the color can be applied on the coating machine. Con-

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siderable change of opinion has taken place in the last few years as to what this maximum speed is. Not so many years ago 150 feet per minute was considered very fast. From 200 feet to 250 feet is now considered perhaps the maximum for book papers. Coated board machines have operated as high as 350 feet per minute. The only limits to the speed seems, as stated, to be the brushing of the color and the ability to build a machine that will operate at these high speeds mechanically correctly. The proper brushing on of the color has been secured by adding brushes so that today we see machines for coating book paper with as many as nine brushes. This means that the brushes run more slowly than would be the case with a smaller number of brushes.

The old time coating machine which would rack itself to pieces at a speed of 200 feet per minute is gradually passing out of use. Some of these old machines were made with wooden frames and cost as little as $600 or $700. The modern coating machines are constructed of heavy steel and cast iron and built to stand high speeds without excessive vibration. The brushes are operated by high grade machine eccentrics and in general the whole machine is built for high speed and continuous operation. The cost of such coating machines is very much greater than the old type, many of them costing over $6,000. The first cost of a coating machine, however, is such a small proportion of the value of the output of that machine for one year that a saving of a few thousand dollars on the machine at the expense of several feet of speed is a saving that should not be made.

The writer believes that the coating width and speed will gradually increase until speeds far beyond that now believed possible will be in everyday use. What this will mean on labor costs and production is self evident. In one class of the coated paper industry it had been the custom to make a 36 inch sheet, and the coating machines were run at a speed of approximately 175 feet per minute. This same mill is now using a 72 inch machine running at nearly 350 feet per minute, which means that one crew is turning out four times as much paper as it did previously. This not only cuts down labor costs but means a great saving in the size of buildings required.

All this increase in width and speed and consequent tonnage, however, makes the problem of drying all the more important. With the old, slow-speed, narrow machines the drying problem was not very serious provided a very long line was used, but with the speed doubled it is practically out of the question to give double the length of line. Unless the drying system would dry the paper as fast as the coating machine could turn it out, it would be useless to purchase high speed coating machines and have their ability rendered unavailable by an insufficient drying arrangement.

Two Classes of Driers

There are practically only two classes of driers for coated paper, the flat drier and the festoon. In the early days coated paper was sometimes passed over a cylinder heated by steam but the length of time available by such means for drying is so short that today it is entirely out of the question even without considering the injurious effect of the contact with the heated cylinder. With the flat drier, mostly in use today, the paper is put on to a canvas belt and carried flat, the coating being dried either by blowing warm air against the surface of the paper or by using steam coils under or around the belt. Where it is not possible to loop paper in festoons this is about the only practical method but, in the writer's opinion, it should only be used when this condition exists. The beneficial value of the festoon drier is that it gives a considerable time element for drying in a comparatively short space. It will be readily understood that if a coating machine is running 200 feet per minute and the paper passes on to the belt of a flat drier, if the belt is 200 feet long, the paper would only have one minute to dry. On a festoon system, however, allowing for the paper to hang in festoons not over 6 feet long and with the sticks 12 inches apart, there would be 13 feet of paper in each festoon so that in 200 feet of festoons there would be 2,600 feet of paper, giving a drying time of 13 minutes instead of one minute. This means that the paper can be dried more slowly a lower temperature used with an important bearing on the condition of the paper.

In a festoon system, the paper after passing from the coating machine is carried on sticks up an inclined elevator and the sticks are then carried along on chains overhead so that the paper hangs in loops, the length of the loops and the distance apart of the sticks being a matter that is varied depending on the class of coated paper. As a general rule the paper should be carried with the sticks further apart at the beginning of the drying operation, while at the other end on the dead rail where the paper is practically dry they may be grouped very close together. The size and shape of the sticks should be determined according to the class of paper. A small square stick will make marks on paper that would not be at all apparent if a round large stick is used. Stick-turning devices may be used for turning the sticks over at various points along the line so that the paper does not remain in the same position on the sticks throughout the entire travel. The length of line necessary for festooning is determined by the length of time required for drying, which again is absolutely dependent on the method of applying the drying medium and its temperature.

The oldest form of drying coated paper festoons was to string steam coils underneath the loops. The heated air rising from the steam coils warmed the under side of the sheet and caused the coating on the top side to dry, but was far from a satisfactory system. In the first place, the heated air should have been applied to the coated side of the paper instead of the uncoated side, accomplishing very much more efficient results. Another bad feature of this method was that the heated air striking the back of the paper passed upwards along the edges of the paper, over-drying the edges and causing an unevenly dried sheet, resulting in great trouble on the winders and in the finishing department.

Air Dried Before Entering Room

A good many years ago attempts were made to dry the coated paper by the use of air which had been warmed before entering the room. Such systems have been greatly improved until today the vast majority of coated paper mills operate with this type of air drying system. The air is conducted into the room through metal ducts, carried above the festoons and is discharged downward over the wet coated surface of the sheet so that this surface tends to dry by the circulation of the air as well as by the application of the heat. By bringing most of the air down into the middle of the sheet and by the use of nozzles of a design which was developed after considerable experiment it was found possible to dry the paper uniformly across the width and not overdry the edges. This development was responsible for the widening of the the coating machines since previous to that time any attempt to run a very wide sheet resulted in a sheet of paper which was damp in the middle and very much overdried on the edges. The circulation of air downward created a rapid circulation of air around the paper with the result that a very much lower temperature could be used and consequently a great improvement in the quality of the paper. As the circulation of air was entirely artificially produced less change was noticed in the air condition of the coating room under varying weather conditions than was otherwise customary. Previously with steam coils on damp still days the circulation of air through the dry room was very slow and the entering air was laden with moisture so that the drying was much retarded during such weather. It was also noticed that while such a room seemed to dry the paper very well in the early morning it would become hotter through the day as the atmosphere in the room became laden with moisture while the drying was retarded but the air drying system overcame that condition. By this system the air is removed from the room at the floor, part of the air carrying excess moisture being discharged to the atmosphere, and part being recirculated performing two valuable duties. One is the sav-

ing of steam required compared with heating outside air entirely and the other the preservation of a certain degree of humidity in the room, which greatly improves the quality of the sheet. The removal of the steam coils from the floor aided in keeping the room clean and free from dust and it was also found that whereas with the steam coil system the steam had to be turned on many hours before beginning operations, with the air system it was necessary to start it up only a few minutes before starting the coating machines. This system, until a few years ago, seemed to be the best that could be accomplished and was one that would dry the paper as fast as the coating machine could produce it, and dry it uniformly across the sheet and in fact was a very satisfactory system.

Double-Coated Paper

Before going on to the improvements and changes it might be well to touch on the double-coated paper.

On double-coating machines the paper is passed through two sets of brushes which apply the wet color on both sides. This method was a great improvement over the tandem machines or coating in two operations, and meant a great increase in tonnage per crew, but led to a great many difficulties in the drying. The paper, before festooning, had at least to be partially dried and had to be dry enough on the underside so it would not scratch by touching any surface. This necessity led to the development of the so-called "floater." The paper, after passing out of the coating machine, passed over this floater, which consists of a series of metal ducts and nozzles by which jets of air support the paper for a distance of approximately 100 feet until it is dry enough to go on to a suction apron and afterwards be festooned. By heating these jets of air which floated the paper, the under side was dried, as well as supported, so that the finished drying of the upper side could be done in the festoons, as in the case of single-coated paper. It will be understood that the development of the floater was a long, slow process, but it has gradually been improved until it is now perfectly feasible to float paper and dry it on the under side. Much care must be exercised in the design of the floater, in the connections to the fans and the method of applying the air. The least eddy current in the air jet from a nozzle will make it impossible to float the sheet. The air for the floater is usually heated to a very much higher temperature than the air for the festoon end. This is due to the fact that the paper is very wet as it leaves the coating machine where the floater is used, and the evaporation of the moisture produces a cooling effect which prevents the sheet from being injured. Part of the air is discharged and part recirculated as in the single-coated paper driers.

The air drying systems both on the single- and double-coated papers were gradually improved until they seemed to produce as good a sheet of coated paper as was possible, and to dry it as fast as the coating machine would produce it. The length of lines was shortened up very materially as more and more air was applied in the circulation. It was also found that by increasing the temperature of the air the paper could be dried in much shorter lines. The development usually meant enclosing the drying lines in tunnels thereby not only keeping the heat in contact with the paper but preventing its escape into the working space of the room. It is entirely possible to dry coated paper in a very short time as high temperature does not injure the paper except at the end of the process when the paper is nearly dry. If, therefore, the paper is kept continuously running through the machines and the drier so adjusted that the paper will be at the right degree of dryness at the dry end, no trouble will be encountered. This, however, is quite difficult to do, but it is entirely possible to dry paper in festoon lines considerably less than 100 feet long but only by using a comparatively high temperature. If the lines of paper are stopped for any length of time, however, trouble is encountered. In changing the roll of paper or any of the numerous cases where it is desirable to stop the festoon lines for a time which may be from one minute to fifteen minutes, the high temperature used on the short lines will dry the paper bone dry, making a sheet not only difficult to handle in the finishing room but one giving trouble in the press rooms.

About this time considerable attention was given to troubles in the lithograph press rooms. They were especially found in press rooms using multi-color presses where one color would be applied one day, another color the following day, etc. In damp weather, especially in summer when the press room was very humid, paper might be received from the coating mill altogether too dry. It would pass through the press taking the first color impression. On the second day it would be found that the paper had slightly expanded and the second color impression would not go on in the same exact location in relation to the first. This is what is called "change in register" and is a very serious difficulty to press room operators. Some days it would be almost impossible to run any sort of high grade lithographs through a press room. This brought up the subject of air conditioning so that there might be a constant temperature and humidity in the press room. Two troubles were encountered at once. The first was the prohibitive cost of accomplishing just that result. There was no trouble in winter when moisture had to be added to the air but in summer when the air had to be dehumidified to remove some of its moisture elaborate systems with ice machines were installed. Tests were made and it was discovered that even an absolutely uniform temperature and humidity in the press room would not cure the troubles. This was due to the fact that the paper came from the coating mill in a varying moisture condition. It will be seen that if a coating festoon has been stopped for five minutes the paper in the festoon would be bone dry and then the machine would start up. In the same ream of paper might be a certain number of sheets bone dry, others at the proper moisture content, and if the drying system was not quite ample there might be some which were too wet. In addition to this situation it was found that during the winter the average coating mill was turning out paper which was a little drier than necessary, due to the fact that the entire mill had a very dry atmosphere from the artificial heat used. In the summer time it was probably a little too damp. If this overdry paper made in the winter went to the press room and the press room was artificially humidified, the same trouble with change in register would be encountered as had been experienced before the press room had been properly conditioned. Bringing a stack of paper into a press room which was properly conditioned, would not change the moisture condition of any part of that paper except at the edges and the top sheet. It was found necessary to hang up the sheets individually if the paper was to be brought to the proper condition.

At this time it should be understood that paper will come to a certain percentage of moisture content depending on the humidity in the atmosphere surrounding the paper. In other words with a certain temperature and humidity a sheet of coated paper will dry down until it contains 4 per cent moisture. If the temperature be increased and the humidity decreased in the surrounding atmosphere, this paper will then dry down to 2 per cent and remain stationary. If, however, the temperature be decreased and the humidity increased the paper which had 4 per cent moisture will begin to absorb moisture until it contains 6 per cent and will then remain constant. This means that paper can be brought to any percentage of moisture content if the atmosphere surrounding that sheet is at the proper humidity. It was found that paper containing about 6 per cent moisture did not change very rapidly in a press room even if the atmosphere in the press room varied considerably. The mean average seemed to be about 6 per cent. It seemed, therefore, that if paper could be secured with 6 per cent moisture content uniformly in every sheet in the press room less trouble would be encountered. This was done at first by hanging individual sheets of paper up in a lithograph plant, which was a very expensive proposition from a labor standpoint. The next move was on the part of the coating mills to secure the same re-

sults. Bearing in mind that paper will reach a fixed moisture content depending on the humidity of the atmosphere surrounding it, one of the coating mills installed a conditioning system on the end of its drying line. This was done by enclosing a section at the end of the drying line and circulating air at a predetermined temperature and humidity. This air was designed to secure 6 per cent moisture content in the paper. Any paper wetter than this would give up moisture and any paper that was drier would absorb moisture. This system was very successful and has been installed by several coating mills. If the paper is dried to 6 per cent in the lines it will pass through a conditioning tunnel without any change in moisture content. If, however, the lines are stopped and the paper in the drying lines becomes too dry, as soon as the line is started up this paper passes through the conditioning tunnel and reabsorbs sufficient moisture to bring it back to approximately 6 per cent. The same thing occurs when the paper enters the conditioning tunnel in a condition which is too wet. It will then continue to give up moisture until it comes to approximately 6 per cent. This meant that the lithograph manufacturers could now get paper which was practically uniform in all weathers and the conditioning of the press rooms was a much simpler and easier problem. It was not necessary to get the press room to exact conditions but only to secure those approximately uniform so that the paper would not change too greatly. It is also possible for this conditioning system to turn out paper with a little less moisture content in winter and a little more moisture content in summer, with the result that the press room could be carried with a higher humidity in summer than in winter, greatly simplifying the air conditioning problem. With this air conditioning system it is now possible to run very much higher temperatures in the drying lines with a consequent greater speed of drying without the danger of every little change in coating or stock or speed affecting the final moisture of the sheet. The conditioning system has proved to be a balance wheel on the drying system and seems to be a logical development.

Wall Paper

In the drying of wall paper it should be handled very much as single-coated paper. The paper is run through what is called a "grounder" machine which is simply a coating machine. The paper then passes down over one set of festoons and is dried and then passes through the printing machine which prints the design on the background. It then passes over another set of festoons which dry the ink. This printed festoon is usually placed directly above the "ground" festoon. Wall paper has a lighter coat and is much more quickly dried than coated paper. It is not so important to have a fixed moisture content as the printing is done instantaneously. It is therefore entirely practical to dry it with a higher temperature and faster than coated paper and the conditioning system does not seem to be necessary. By using a high temperature it is entirely possible to dry wall paper in lines comparatively short but it is necessary to make sure that the paper is not allowed to hang in the lines longer than it should or a brittle, dry sheet which will give trouble on the rollers will be the result. Wall paper is sometimes dried on flat belts and by using high temperatures has been dried in as short as one-half minute. The widths of wall paper is very much narrower than any coated paper and the whole problem is much easier.

Waterproof and Glazed Paper

Waterproof paper and glazed paper is usually handled very similar to single-coated papers and really enters the same class. The moisture content feature is not important on this, except in isolated cases. The length of lines and the amount of circulation of air is almost entirely dependent on the coating applied.

Gummed Paper

Gummed paper divides into several classes, depending on whether fish glue, animal glue or dextrine is used. These differences determine to a considerable extent the design of a drying system as to quantity and temperatures but are mostly treated in the same way as far as the type of system is concerned and can be treated in this article as one. After the paper passes through the gumming machine, the most common form of drier was the so-called Crowell or scroll drier. The paper in this case passed over a frame drum or over a scroll whereby it was kept under tension and exposed to hot air and finally wound up in the center of the scroll. Gummed paper has a tendency to curl badly on the edges and it was felt that by keeping it under tension this tendency to curl was overcome as much as possible. It was recognized that the longer the distance the paper traveled, and the lower the temperature used on the paper, the better. Of late, however, gummed paper is being more and more festooned and dried very similarly to coated paper. The conditioning system has proved especially valuable on gummed paper because the limit of speed of gumming and drying soon got to be higher than the speed of reeling. The speed of reeling the paper depended greatly on the amount of curl on the edges. By putting the gummed paper through a conditioned air system, the edges which were too dry reabsorbed some moisture and tended to straighten out. Formerly it was usual to put jets of steam on the edges of the gummed paper hanging in the festoons before passing to the reel. This added moisture but also added heat and there was no control over it. It was very easily possible to put too much moisture on the gummed paper with the result that it would be sticky and if reeled up in this condition the results were very serious. It was at first thought very radical to attempt to put moist air on gummed paper which it was feared would become sticky but it should be borne in mind that conditioned air, while moist, has no free moisture, which is the great advantage it has over the steam-jet method of humidifying. Therefore the paper does not come in contact with any drops of moisture but only absorbs the amount of moisture that it was predetermined it should.

Sand Paper and Similar Products

Sand paper, emery paper and similar products range all the way from paper covered by very fine sand, such as used for polishing furniture, up to the type of paper used on grinders with very coarse grits. This class of product also is festooned but requires a very much longer time to dry than coated paper. Formerly it was considered that a sand paper machine should run until the room was entirely filled with festoons of paper and then allowed to stand over night until the roomful became dry. With modern air drying systems it has been found possible to keep operating the machine and drying it as fast as it comes from the machine It is necessary, however, to have lines as long as 500 feet or over. It is necessary to use a low temperature on account of the glue that is used and this greatly retards the speed of drying. In the case of this drying, however, it was found best to discharge the warm air upward underneath the loops of paper. The moisture in the glue and size seems to strike through the paper and the sand on the surface seals the surface and prevents the evaporation of moisture from the upper side as it does in coated paper. Great trouble is encountered with the curl of the edges in sand paper and at the present time it is the usual custom to use steam jets for "breaking down" the edges. By discharging the air upward more in the middle than on the edges, however, considerable of this trouble is obviated and a much more uniformly dried sheet is secured.

Conclusion

In closing this article it should be borne in mind that all of these systems should be designed only after a thorough knowledge of the problem and that slight changes in the coating or speeds or widths must be carefully determined in the design. The question of moisture content and change of register of paper is one that is becoming more and more important. It is becoming recognized that it is not sufficient to give a sheet of paper which has the proper strength and the proper surface and proper formation, but it also must have the proper moisture content.

The Manufacture of Lake Colors

By H. H. Holden*

The term "lake colors" is applied to pigments made from dyes and coloring matters by precipitating the coloring matter as an insoluble compound which can be used for pigmental purposes to distinguish them from natural pigments, such as ochres, umber, etc., and from chemical colors manufactured by direct combination and decomposition of distinct salts, e. g., such colors as lead chromates, chinese blue, emerald green, etc.

Introduction of Coal Tar Colors

Until the introduction of coal tar colors, lakes were made from the natural dyes such as logwood, cochineal, etc. These were superseded by lakes made from artificial colors because the latter can be produced more easily and cheaply and possess greater staining and brilliancy of shade and can be more readily standardized.

In the manufacture of lakes from artificial colors it is very important to understand the chemistry, constitution and properties of the various dyes. Every color has some chemical which will precipitate it to the best advantage and a knowledge of the way these chemicals react is very important.

The difficult and intricate chemistry of the manufacture of dyes does not necessarily concern the maker of lake colors, but the chemical nature of the colors he is using does, e. g., the reason why he cannot precipitate basic colors with berium chloride when acid colors are readily thrown down by the same compound, requires his careful attention. In other words it is not the nucleus of the molecule of any given color which is of importance to the lake manufacturer, but rather the substitution and decomposition products which can be formed by the use of different chemicals.

Reducing the Number of Shades

The policy of trade customs has had its effect in reducing the number of shades of colored coated papers demanded by the trade; this in turn has reduced the number of lake colors which it is necessary to make and keep on hand. The following colors are now manufactured: Red, Orange, Yellow (Lemon and Chrome shades), Green, Blue and Black. By the use of any of these primary colors it is possible to obtain almost any shade imaginable. It is found to be much more satisfactory to make the primary shade and then strike a color than to try and make a lake which will give the exact shade on the paper with one color.

Red Lake

A red lake of good quality may be made on a blanc fixe base using Scarlet 2 RR as a dye. This is one of the cheapest acid colors of domestic manufacture and has been on the market about five years. The following procedure will be found satisfactory in making lakes from the acid colors. A 10 per cent solution of alum is run into a large tank, having a conical bottom and agitated by air, and heated to 80° C. Another 10 per cent solution of soda is then run in, forming sodium sulphate and aluminum hydroxide. The dye is then added in about a 10 per cent solution and finally the barium chloride is run in in a concentrated solution. This forms an insoluble barium salt of the dye as well as barium sulphate and sodium chloride. Thus there is produced a mixture of the barium salt of the dye, barium sulphate, aluminum hydroxide and sodium chloride. This mixture is then filtered and washed, thus dissolving out the sodium chloride and giving a lake of the three other compounds mentioned. This lake color is very fast to light and alkali, which are the principal properties demanded for coated papers. The same procedure may be used on all acid colors, although the properties of the lake will repend upon the chemical used to precipitate the dye.

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As a concrete example of a lake made according to the preceding method the following quantities of materials would be used for a red lake:

Alum	165 lb.
Soda ash	75 lb.
Barium chloride	192 lb.
Scarlet 2 RR	40 lb.

This will give about 750 lb. of a 40 per cent dry lake.

The Yellow Colors

The yellow colors are not made from the artificial dyes but the same method and apparatus can be used in striking the colors. The manufacture of the chrome colors, as they are called, depends on the action of acetic acid on litharge forming a basic lead acetate. This is then treated with sodium dichromate which forms a basic lead chromate which is the yellow pigment desired. This pigment can be shaded to an orange pigment by heating and the addition of a little alkali. These chrome colors are very bright, have good fastness as well as good covering power, and can be made very economically.

Blue and Green Color Lakes

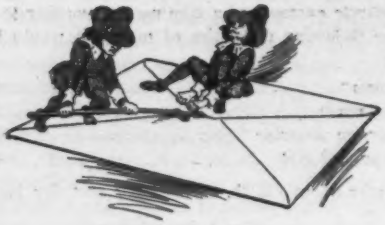
The blue and green color lakes are frequently made from the class of colors known as the basic colors. The procedure, however, varies a little and is as follows: The alum and barium are added as usual, then the soda ash is added and the base is then washed free of the sodium chloride which is formed. This is usually done by decantation. The dye is then added and the precipitating agent follows, which is tannic acid for the basic colors. Sometimes tartar emetic is used afterward, as in cotton dyeing, to give a lake which is faster to light and washing. The basic colors have a great deal more tinctorial power than acid colors so that much less of the dye may be used, thus reducing the cost considerably. For a green shade malachite green may be used and methylene blue for a blue shade.

Black Lake Acid Colors

In the manufacture of a black lake acid colors are again employed, nigrosine being the color mostly used for the black shades. Where a jet black shade is required a slight amount of yellow is used to neutralize the blue cast which most black shades seem to have. For a dull black shade a little carbon black may be mixed with the lake; this, however, is simply held mechanically and is not a chemical precipitation. A black of great brilliance, known as "Friction Black" is generally a combination of logwood and carbon black.

It is possible to use both acid and basic colors together, but it is not advisable because one dye is apt to precipitate the other. It is generally much better to precipitate the lakes separately and mix them later. It is true in the manufacture of lakes, as in the dyeing of cotton, that a much brighter shade can be obtained by using the colors individually than by combining two or more colors to get the same shade.

In this brief description of the methods of preparing lakes no attempt has been made to name all the chemicals which can be used as precipitants and the discussion has been restricted to those which find the greatest use commercially in preparing lakes for coated papers. No dye has been recommended as the best for any given color since a change in the precipitating agent may result in a lake of very different properties. In fact the precipitating agent is one of the most important considerations in the preparation of lakes.



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Advantages of Lake Colors

The advantages which the lake colors have over the use of the straight aniline colors are as follows: First, the dye after precipitation is in its most finely divided form which is not the case if the color is mixed with clay after dissolving in boiling water. Secondly, by the use of lake colors we have a blanc fixe base which is much superior to clay for colored coated papers, although it is considerably more expensive. Thirdly, where a very deep shade is to be obtained it requires considerable dye which, if used mixed with the clay, requires some water to dissolve it, thus thinning down the coating mixture to the point where it affects its spreading properties considerably. Of course in the case of basic colors the clay has more or less affinity for the dye but not enough to equal the precipitating power of the tannic acid.

Coloring Matters for Coated Paper

By Norman Clark*

The coloring of coated paper may be divided into three sections each dealing with a different form of coloring matter; namely, dyes, color lakes or pulps, and pigments. Besides these there is a special section section dealing with Metal Papers. These various forms of coloring matter are often mixed to give some desired effect but in general dyes are used in producing tints, pulps for deep colors, and pigments for plates or lithos where a flat tone is wanted.

A—Dyes

Dyes may be placed in four classes for this consideration.

1. Basic.
2. Acid.
3. Direct, cotton and wool.
4. Those dyes which require a special solvent or other agent to bring out their strength thus rendering them unsuitable for coating work.

1. Basic Dyes

The coating mix is usually alkaline in reaction due to the casein solution, wax emulsions and satin white, if any be used. Besides this there is very often alkali in the form of ammonia added, as such, or in connection with an oil, to better the working conditions of the mix. This condition decolorizes or discolorizes the basic dyes with the possible exceptions of Rhodamine and Safranine. This is particularly noticeable in concentrations of more than 2 per cent. Then there is the presence of casein which tends to precipitate the basic dyes. Beyond this there is the tendency to change in hue when exposed to heat in a moist condition as occurs when the coated sheet is passing down the drying lines. With the exception of Rhodamine, Auramine and Methylene Blue B, the dyes are very fugitive when exposed to light. However, the basic dye may be used with glue or an acid starch for size if too much is not expected of the finished sheet. It must be remembered that the great attraction and temptation to use basic colors lies in the fact that they exceed in brilliance any other class of dyes.

The following lists of dyes are merely those which the writer is familiar with from his own work, and many others might be added, particularly in the acid group.

The basic dyes available for use are as follows:

Rhodamine	Methylene Blue	Rubine
Safranine	Victoria Blue	China Green
Fuchsine	Paper Blue	Diamond Green
Auramine	Methyl Violet	Night Blue
Malachite Green	Bismarck Brown	Nile Blue
Victoria Green	Methylene Grey	Ethyl Purple
Brilliant Green	Chrysoidine	

2. Acid Dyes

These dyes form the most available class from which to select colors for coating work. They are not affected by casein and are not in general affected by the amount of alkali present in the mix. They are fast to drying conditions on the line and are much more permanent to light in the finished sheet than are basic dyes.

The acid colors the writer is acquainted with are as follows:

Crocein Scarlet MOO	Resorcin Yellow	Acid Violet 4B NS
Brilliant Crocein C	Tartrazin	Violamine
Crocein Orange	Metanil Yellow	Resorcin Brown
Fast Acid Red GX	Fast Acid Green B	Acid Blue Black N
Brilliant Red J	Acid Green L Ex.	Nigrosine J, B, 819
Ponceau R	Xylene Fast Green B	Cloth Red
Acid Ponceau	Alizarin Green C	Eosine
Fast Crimson GX and BN	Brilliant Acid Blue	Rose Bengal
Orange, R, A, F and II	Acid Blue No. 196	Napthol Yellow
Chinoline Yellow	Xylene Blue	Napthol Green
Brilliant Yellow G	Patent Blue	Alizarin Sapphire
Xylene Yellow	Fast Blue A S	Alphazurine
Fast Lt. Yellow 2 G		

3. Direct, Cotton and Wool Dyes

Of these the so-called Wool Colors are really the only available ones. This is due to the fact that the direct and cotton colors flatten and dull when mixed with clay so they are of little use. The demand of the colored coated paper trade is largely for bright colors. This does not refer to a mill-making colored tag or label stock where these colors may very likely be used. The Wool Colors available are as follows: (These may be classed by some as Acid Dyes.)

Wool Scarlets (various markings)
Wool Blue B and 3B
Wool Green S

The most useful direct colors are:

Pheno colors
Benzo purpurin

4. Special

The reason dyes other than those classes before mentioned cannot be used is that they require a special solvent, mordant or developer, and the presence of such material would injure the coating mix.

B—Color Lakes or Pulp Colors

Pulp colors are usually acid or basic dyes thrown down on a base by a precipitating agent. A common base is a mixture of clay, barytes, soda ash and alum and the acid dyes precipitated with barium chloride. The basic colors are often used to top off the acid colors to add brilliancy to the lake, but on account of their fugitiveness are not often used alone. The number of color lakes is large but there is more uniformity in their nomenclature than in the case of dyes. The difference in the working qualities of the pulps from various manufacturers arises from a difference in manipulation of the pulp during formation rather than in the original materials used.

The Pulp Colors may be listed as follows:

1. Reds
   - Turkey Red
   - Persian Red
   - Arabian Red
   - Granite Lake
   - Red Lake
   - Maroon

5. Blue
   - Marine Blue
   - Blue Lake
   - Steel Blue

6. Violet
   - Violet Lake

*Mgr. TAPPI, Whitman Manufacturing Co., Holyoke, Mass.

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2. ORANGE
- Orange Lake
- Victoria Orange

3. YELLOW
- Lemon Yellow
- Medium Yellow
- Other varieties of chrome yellows

4. GREEN
- Emerald Green
- Brilliant Green
- Nile Green
- Silk Green

7. BROWN
- Raw Sienna, Burnt " — Really Pigments
- Raw Umber, Burnt " — Really Pigments

8. BLACK
- Black Lake, Friction Lake — Really Pigments

9. BRONZE
- Bronze Lake

C--Pigments

These are insoluble solids which can produce the sensation of color in other substances by being intimately mixed with them in the form of a powder or powder suspension in water. Papers colored with pigments are not capable of taking as high a glazed finish as those colored with pulp colors, consequently pigments are used either in conjunction with pulps or alone for the production of flat tones. They have one redeeming feature, however, and that is their fastness to bleeding and light.

The common pigments are as follows:

RED

Oxide of Iron
Venetian Red, Indian Red, Light Red and Burnt Sienna.

Oxide of Lead
Red Lead and Orange Lead.

Sulphide of Mercury
Vermilion.

ORANGE AND YELLOW

Chromates of lead, barium, zinc and strontium and chrome colors.

Natural Earths
Siennas and ochres.

Cadmium Sulphide
Cadmium Yellow.

GREEN

Aceto arsenite of copper
Emerald Green.

Native carbonate of copper
Malachite.

Zincate of cobalt
Cobalt Green.

BLUE

Complex silicate of soda and alumina
Ultramarine.

Semi-organic compounds of iron
Prussian Blue, Chinese Blue.

A compound of cobalt oxide and alumnia
Cobalt Blue.

BROWN

Inorganic earth colors
Umbers.

Semi-organic earth colors
Vandyke Brown.

BLACK

Pure carbon blacks
Lamp Black, Vegetable Black and Carbon Black.

Contain other materials
Animal Black, Bone Black, Ivory Black and Drop Black.

D—Metal Papers

Metal papers depend for their brilliancy on a coating of metal either put on the sheet as a coating or dusted on a varnish coat as the clear metal powder. The metal powders consist of:

BRONZES

a. Various combinations and treatments to give varying shades.

b. Colored bronzes—colored by heat treatment and by dyes.

SILVERS

a. Tin.

b. Zinc.

c. Aluminum.

E—Methods of Handling Coloring Matters

DISSOLVING DYES

A satisfactory method for dissolving dyes is to make into a paste with cold water and then add as much boiling water to the paste as the quantity of dye calls for, stirring continually during dilution. In the case of basic dyes a little acetic acid may be added to the paste. It is well not to exceed a concentration of half a pound of the dye per gallon of solution.

Exceptions to this procedure are occasionally met with as in the case of auramine and methyl violet. With the former the water for dilution should not be over 160° F., as the dye breaks up above that temperature. Methyl violet should be treated directly with hot water as cold water tends to form a hard mass which is extremely difficult to dissolve.

ADDING TO COATING MIXTURE

It is always best to add the dye solution to the mix in as dilute a form as possible. This will depend upon the end consistency of mix desired. It is not advisable, except in special cases, to exceed a concentration of 4 per cent dye based on the amount of white pigment present in the mix. The dye should always be added before the size and waxes. It may be added with a large amount of water direct to the dry white pigments or with a correspondingly smaller amount of water to the water paste of the white pigments.

DIFFICULTIES IN THE USE OF PULP COLORS

As pulp colors are simply suspensions in water of insoluble coloring matters, the percentage of water present in a pulp is of peculiar importance. In the writer's experience this water varies from 35 per cent to 88 per cent in different pulps and may vary 15 per cent in the same shipment of the same pulp. This factor makes a big difference in the cost of coloring, and manufacturers of colors should specify at what solid content the lakes or paste colors are billed.

But it is in their use that this factor of moisture content causes the most trouble. Take for example a lake color whose solid content is standard at 40 per cent; 100 lb. in this case yields 40 lb. dry color. If it runs 48 per cent dry the same quantity of paste yields 48 lb. of dry color and if on the other hand an excessive amount of water is added to the barrel to overcome evaporation (as is practiced by many manufacturers of coated papers) the dry weight may go as low as 33 lb. per 100 lb. of paste. These figures, 40 lb., 48 lb., and 33 lb., are by no means out of reason and it is seen that, under such conditions, it is practically impossible for a color man to produce a duplicate color mixture without an excessive amount of care.

It is possible to bring each pulp, in reasonable quantities, to a predetermined standard of moisture, and hold it there for a considerable time. For this refinement proper containers and strict testing are necessary but the greater certainty of results probably warrants the expense.

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Anti-Friction Bearings in the Pulp and Paper Industry

By Geo. H. Spencer*

Whenever improvements in paper machinery necessitate designs which incorporate heavier loads, higher speeds, etc., the engineer and machinery designer are confronted with problems of increased bearing loads, shaft stresses, shaft deflections, lubrication, maintenance, and numerous other items that follow in the wake of such improvements. The success of the anti-friction bearing on the slow speed machines has brought them into prominence when considering improvements for machines of higher speeds. The selection of the proper anti-friction bearing size and a suitable and permanent mounting design is, like many other questions, best determined by the combined studies of the anti-friction engineer whose previous experience covers hundreds of applications, and the paper mill engineer whose knowledge of the operating conditions of the various rolls is invaluable.

Cylinder Machine

It was about fifteen years ago when ball bearings were first used on papermaking machinery in the United States, one of the first applications being that to cylinder molds and couch rolls of the cylinder machine. These rolls are relatively slow turning but early installations of properly selected bearings, properly housed against intrusion of water have proven the success of the anti-friction bearing and its application to the cylinder mold might be considered today as universal. It has been found where ball bearings are used on cylinder molds, that the usual gearing arrangement for driving the molds can be eliminated and that the molds can be turned by the drag of the felt alone. This has eliminated the strains which are set up in the felt between adjacent gear driven molds, due to the different surface speeds, and it has been found by some mills that the application of ball bearings and the elimination of driving gears has resulted in increases in felt life of as much as 50 per cent.

Another location on the cylinder machine at which the anti-friction bearing has justified its worth is the primary or intermediate press section in which the series of top and bottom rolls are driven only by contact with the felt and the anti-friction bearing with its low frictional qualities has permitted of easy turning of these rolls with minimum drag on the felt and stock resulting in a better grade of stock and longer life of felts. There are numerous other rolls in the cylinder machine such as return felt drum, felt carrying rolls, and main presses, to which the anti-friction bearing has been applied but time is too limited to go into a discussion of these applications at this tme.

High Speed Fourdrinier

The type of machine which seems to hold the prominent place in the paper industry today is the high speed fourdrinier for book, news, tissue, and kraft, and the greatest part of this anti-friction bearing discussion will apply to this type of machine and particularly as pertaining to the wet and dry sections.

Taking up the question of the wet section first, it might be well to discuss briefly the nature of the operation of the plain bearing and show thereby the superior operation of the anti-friction bearing. The plain bearings on the various rolls of the wet section require considerable attention because of the fact that water is always present, free to enter the bearing box, thereby disintegrating and destroying the lubricant. Again there is a rubbing of the shaft against the journal box with the resultant high friction and wear which will cause the rolls to operate inaccurately and produce additional strains on fourdrinier wires.

Ball bearings have been applied to various rolls of fourdriniers for a number of years past and it has been found that properly selected bearings, mounted in properly designed housings, will operate satisfactorily without a great amount of attention. Some mills have found, after applying anti-friction bearings to breast, table and wire rolls, that wire life has been increased as much as 20 per cent, which is unquestionably due to the low coefficient of friction of the anti-friction ball bearing which is .0017 as compared with the coefficient of the well lubricated plain bearing which, under average conditions, is .015.

Fourdrinier Wires

There should be considerable interest in the work to be done by a committee recently appointed for the purpose of making a study of fourdrinier wire life and it will unquestionably be found that such items as percentage of grit in clay, method of cleaning wires, quality of water, unbalanced rolls, improper suction and drag on suction boxes, sorting and winding of wire, friction in roll bearings, and running tension in wire, will all bear certain relations to the factors affecting the life of wires.

One of the main causes of shortness of life and deterioration of fourdrinier wires is the wear caused by friction of the under side of the wire against certain parts of the machine. There is friction, and consequently wear, wherever the moving wire comes in contact with some part which has not the same surface speed as the wire. For instance, when the wire travels over a table roll which turns true and with practically no friction in the bearings, it does not slide over the roll and there is no wear, but suppose that the table roll is not true and does not turn freely, then the wire will slide over it trying to make it turn. The friction is then proportional to the difference in surface speed between the wire and the table rolls. This same condition exists for all rolls of the wet end except the couch roll which is mechanically driven. In the case of the stretch roll and one or more carrying rolls the upper side of the wire will show wear.

To demonstrate the small amount of energy necessary to turn a ball bearing equipped table roll as compared with a plain bearing equipped roll a test was conducted with rolls for a 202 inch machine and the results showed that a weight of one ounce tied to a string wrapped around the ball bearing equipped roll would keep it turning whereas a weight of seven ounces tied to a string and wrapped around the plain bearing equipped roll was necessary.

It was found on shaking tables that wear in plain bearings will permit of a varying degree of lateral play of adjacent rolls and consequently these rolls will, during each shake, slide laterally across the wire, thereby causing additional wire wear. With ball bearings it is possible to stabilize each roll against this endwise or lateral play and by so doing the life of wire can be increased to some extent.

Wire Tension

The two points of particular interest to the maker of anti-friction bearings are elimination of friction in the roll bearings and running tension in the wire. This running tension is something that is quite important because the resultant of this and the weight of the rolls produces the load on the bearings and although it has been possible to obtain accurate data concerning weights applied, it has been found difficult to secure definite information pertaining to the running tension. Calculations based upon weighted stretch rolls, also upon hand-adjusted stretch rolls have been made but there are indications that the tensions thus determined do not correspond with the actual running tensions.

In discussing this situation with the wire manufacturers it was learned that when making a wire of 70 ft. 6 ins. length of 0.008 inch brass wire, 70 warp, 46 weave, 3½ inches of the total length is cut off after the wire is woven thereby shortening it to 70 ft.

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White and India (Semi-dull Surface)

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White and India (Semi-dull Surface)

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TABULATION NO. 1—TENSILE TEST ON NO. 60 WIRE. SPECIMEN, ONE INCH WIDE

Load Pounds	Length Inches	Elongation		Permanent set		Load Pounds	Length Inches	Elongation		Permanent set	
		Inches	Per cent	Inches	Per cent			Inches	Per cent	Inches	Per cent
5	20.805	.....	.....	.....	.....	5	20.832	.....	.....	.....	.....
20	20.832	0.027	0.130	0	.....	65	20.949	0.144	0.692	0.047	0.226
5	20.805	.....	.....	.....	.....	5	20.852	.....	.....	.....	.....
25	20.843	0.038	0.183	0	.....	70	20.976	0.171	0.822	0.066	0.317
5	20.805	.....	.....	.....	.....	5	20.871	.....	.....	.....	.....
30	20.852	0.047	0.266	0.007	0.0336	75	21.031	0.226	1.086	0.113	0.543
5	20.812	.....	.....	.....	.....	5	20.918	.....	.....	.....	.....
35	20.867	0.062	0.298	0.007	0.0336	80	21.101	0.296	1.423	0.179	0.860
5	20.812	.....	.....	.....	.....	5	20.984	.....	.....	.....	.....
40	20.875	0.070	0.336	0.007	0.0336	85	21.203	0.398	1.912	0.273	1.310
5	20.812	.....	.....	.....	.....	5	21.078	.....	.....	.....	.....
45	20.887	0.082	0.394	0.007	0.0336	90	21.363	0.558	2.680	0.429	2.060
5	20.812	.....	.....	.....	.....	5	21.234	.....	.....	.....	.....
50	20.894	0.089	0.428	0.011	0.0528	95	21.594	0.789	3.790	0.656	3.150
5	20.816	.....	.....	.....	.....	5	21.461	.....	.....	.....	.....
55	20.906	0.101	0.486	0.015	0.0720	100	21.852	1.047	5.028	0.898	4.315
5	20.820	.....	.....	.....	.....	5	21.703	.....	.....	.....	.....
60	20.929	0.124	0.596	0.027	0.1297	Broke at 130 lb.					
5	20.832	.....	.....	.....	.....	Length after rupture, 23.672 inches.					

$$\frac{23.672 - 20.805}{20.805} \times 100 = 13.8\%$$

2½ ins. The ends are then sewn and welded together and the wire stretched so that the wire becomes 70 ft. 10½ ins., or an elongation of 0.94 per cent. When the stretch load is released it is found that the wire has stretched and taken a permanent set so as to give the desired 70 ft. 6 ins. length, or a permanent set of 0.415 per cent.

Samples of No. 60 and 70 wire were obtained from the wire manufacturers and submitted to the S. K. F. Research Laboratory, Philadelphia, Pennsylvania, for test. It was thought that the running tension in the wire would probably not exceed the stretch tension to which the wire is subjected during its manufacture, such as outlined in the previous paragraph, therefore, the specimens sent to the laboratory were tested in such a way as to determine the load per inch of width necessary to give 0.94 per cent elongation and by referring to the following tabulations, which give complete results of the laboratory test, particularly tabulation No. 2, covering 70 mesh wire, you will see that the stretch tension is between 70 pounds and 75 pounds per inch of width of wire. From this tabulation it will also be noted that the percentage of permanent set of 0.415 per cent falls between tested loads of 70 pounds and 75 pounds per inch of width. It will also be noted that the breaking strength in this wire is 120 pounds per inch of width.

The maximum running tension in the wire takes place between the suction boxes and couch roll, and may fall between 70 pounds and 120 pounds per inch of width of wire. It is possible that the committee on fourdrinier wires will, during their study of the wire problem, be able to obtain certain definite information concerning this point.

In the following tabulations and curves, data are given showing total elongation and permanent deformation of the wire gauze at variable stresses. The permanent deformation was obtained by each time relieving the load to five pounds. The amount of permanent stretch was measured. The dotted curve represents the latter values, while the full curve represents the total amount of deformation. From the curves it is seen that the elastic limit cannot sharply be determined, but it is approximately between twenty and forty pounds per inch width.

It is impossible to determine the elastic limit of such a material. There will be some permanent set at almost zero load.

Based upon this study of the probable wire tension it has been possible to arrive at certain load factors for the determining of adequate bearing sizes.

Drier Section

Ball bearings have been applied to felt driers and there are a number of installations in the United States which have been running for several years without the slightest trouble. It therefore might be considered that this application has passed the experimental stages. Due to the low coefficient of friction of the ball bearing and the fact that these rolls are usually turned by contact with the felt only, the drag on the felt is materially reduced and mills have stated that the life of drier felts has been substantially increased when these rolls were changed from plain bearings to ball bearings.

The successful operation of ball bearings on the felt drier, the proven ability to meet the load and temperature conditions, the ease of proper mounting to care for the expansion and contraction of the

TABULATION NO. 2—TENSILE TEST ON NO. 70 WIRE. SPECIMEN ONE INCH WIDE

Load Pounds	Length Inches	Elongation		Permanent set		Load Pounds	Length Inches	Elongation		Permanent set	
		Inches	Per cent	Inches	Per cent			Inches	Per cent	Inches	Per cent
5	16.980	.....	.....	.....	.....	5	17.000	.....	.....	.....	.....
20	17.000	0.020	0.118	0	.....	65	17.090	0.110	0.648	0.025	0.1470
5	16.980	.....	.....	.....	.....	5	17.005	.....	.....	.....	.....
25	17.010	0.030	0.177	0	.....	70	17.110	0.130	0.766	0.040	0.2360
5	16.980	.....	.....	.....	.....	5	17.020	.....	.....	.....	.....
30	17.010	0.030	0.177	0.005	0.0294	75	17.180	0.200	1.180	0.110	0.6480
5	16.985	.....	.....	.....	.....	5	17.090	.....	.....	.....	.....
35	17.020	0.040	0.236	0.005	0.0294	80	17.230	0.250	1.470	0.140	0.8250
5	16.985	.....	.....	.....	.....	5	17.120	.....	.....	.....	.....
40	17.025	0.045	0.265	0.005	0.0294	85	17.350	0.370	2.180	0.250	1.470
5	16.985	.....	.....	.....	.....	5	17.230	.....	.....	.....	.....
45	17.035	0.055	0.324	0.010	0.0590	90	17.530	0.550	3.240	0.430	2.530
5	16.990	.....	.....	.....	.....	5	17.410	.....	.....	.....	.....
50	17.045	0.065	0.383	0.015	0.0884	95	17.770	0.790	4.650	0.670	3.950
5	16.995	.....	.....	.....	.....	5	17.650	.....	.....	.....	.....
55	17.060	0.080	0.472	0.015	0.0884	100	18.070	1.090	6.420	0.960	5.660
5	16.995	.....	.....	.....	.....	5	17.940	.....	.....	.....	.....
60	17.070	0.090	0.530	0.020	0.1180	Broke at 120 lb.					
5	17,000	.....	.....	.....	.....	Length after rupture, 19.190 inches.					

$$\frac{19.190 - 16.980}{16.980} \times 100 = 13.0\%$$

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drier has brought it into the lime-light for serious consideration on main paper driers.

Tensile Test on Wire

One of the most recent developments has been the construction of a 700 foot per minute fourdrinier machine having every roll on the machine equipped with self aligning ball bearings including the seventeen 60 inch x 173 inch driers. After the driers had been set in place and all gears in mesh, but doctors and steam joints not installed, one man was able to start in motion the entire section of seventeen driers by pulling upward by hand on the spoke of one of the main gears. Another interesting feature of this machine is the small amount of lubrication attention necessary. All ball bearing housings were properly filled upon installation and ran during a four months' trial and operating period without attention and it was found upon opening up some of the housings that the lubricant was in excellent condition. Instructions, however, have been issued that the bearings should be systematically looked at once every two or three months, as a precaution against deterioration of lubricant.

In addition to the power and lubrication savings effected by mounting drier cylinders on anti-friction bearings there appear to be advantages dealing directly with the improvement of the quality of the paper and also the reduction in felt wear and broke.

TABULATION NO. 3—TENSILE TEST ON NO. 60 AND 70 WIRE

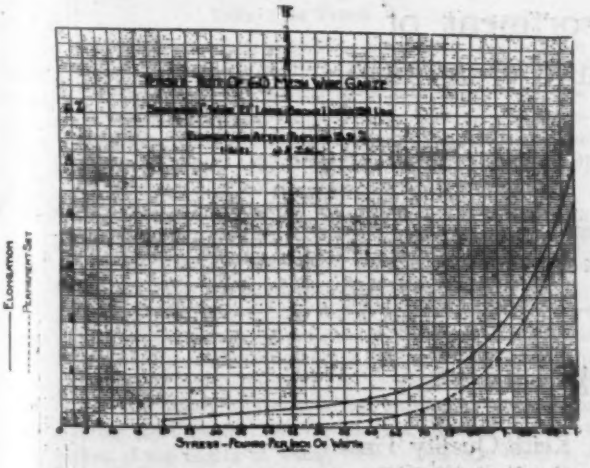
The test results are compiled in the following table

Ultimate Strength and Elongation

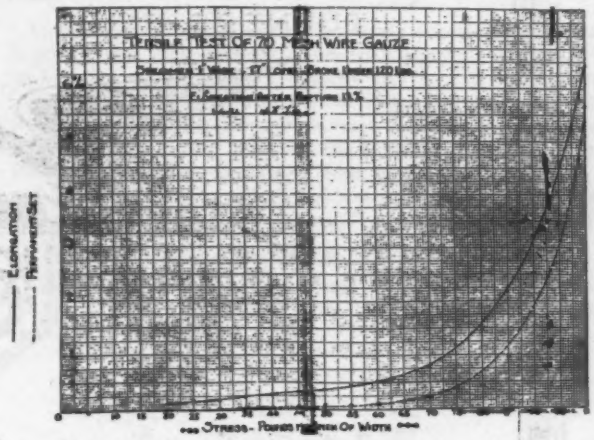
Mesh No.	Width of specimen, in.	Breaking load, lb.	Breaking load per inch of width, lb.	Distance between jaws, in.	Elongation at rupture, in.	Elongation at rupture, %
60	3	425	141	4	7/8	20.9
60	3	410	136	4 1/4	11/16	19.1
60	3	400	133	4 1/4	7/8	20.6
70	3	340	113	4	5/8	13.1
70	2 7/8	360	125	4 1/4	3/4	18.2
70	2 7/8	350	122	3 7/8	3/4	19.3

Load Required to Make Approximately 9 Per Cent Elongation

Mesh No.	Width of specimen, in.	Load required, lb.	Load req. per inch of width, lb.	Distance between jaws, in.	Elongation under load, in.	Elongation, %
60	3	335	111	4.062	0.363	8.94
60	3	320	106	3.953	0.357	9.04
60	3	340	113	4.093	0.369	9.02
70	3	305	101	3.937	0.343	8.74
70	3	310	103	3.844	0.356	9.26
70	3	310	103	3.875	0.355	9.17



With the main driers geared together the drier felts and stocks, running through the section, will be subjected to varying strains between adjacent cylinders because of the difference in surface speed. Manufacturers have stated that the usual tolerance for grinding the outside diameter of driers is 0.01 inch. The maximum difference, therefore, between any two cylinders can be 0.02 inch or a difference of approximately 1/16 inch measured on the circumference. On high speed machines running 1,000 feet per minute a



five-foot drier turns approximately 65 r. p. m. and, consequently, there can be a maximum difference in surface speed of adjacent cylinders of approximately 4 inch per minute which must be taken care of by slippage of the felt with probable detrimental stresses within the felt and stock. This brings up the question of the magnitude of stresses that may be set up within the fibres of the stock without causing permanent harmful effects.

By the elimination of the gearing in a drier section, thereby permitting each cylinder to turn independently of the other, differences in diameter causing differences in surface speeds would not be detrimental and it is possible that one of the future developments will be the more general use of ball bearings on main paper driers which, due to their low frictional qualifications, may permit of the driving of the driers by contact with the stock or with the felt only.

Miscellaneous Machinery

Ball bearings have been applied and used successfully for a number of years on machines such as the Jordan engine, refiner, disc barker, chip crusher, de-inking and de-fibring machines, slitters and rewinders, etc., and each one of these applications holds its interesting problem but a detailed discussion will be withheld until some future time.

Such problems as the application of anti-friction bearings to pulp grinders, holland type beaters, calender stacks, etc., are being studied and it is possible that with the new type of spherical roller bearing now on the market these particular problems can be solved satisfactorily.

Advantages of Co-operation

Work on the various problems in the pulp and paper industry with the various mills and machinery manufacturers has been found most interesting and enjoyable and we take this opportunity of thanking all those who have co-operated with us so earnestly. To carry on this work still further, thereby giving to the Association and the industry as a whole the greatest advantages that can be obtained by the use of anti-friction bearings, we need a continuance of this co-operation and in fact an opportunity to work even more closely with the various mills, manufacturers, and appointed committees.

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Testing of Sizing Quality in Paper with Valley Tester

By J. E. Alexander*

The scope of this paper is to make some comments regarding the testing of sizing in paper with the Valley size tester as observed in using the tester in the daily routine and in specal work. The theory of the Valley size tester is that the conductivity of the paper for an electric current will increase with the gradual permeating and final saturation of the paper by an electrolytic solution. A short summary of the earlier work in the determination of sizing qualities by the conductivity method will be given.

Appreciations of Conductivity Method

The conductivity method as suggested by Kohlrausch for determining the concentration of solutions by measuring their electrical conductivity, was applied for determination of the sizing qualities in paper by Okell.

Okell (*Paper*, April 11, 1917) suggested the clamping of the paper between the two compartments of a hard rubber cell and applying a solution of an electrolyte under slight constant pressure to both sides of the paper, a direct measurement of the gradual rise in conductivity through the sheet being made, as it is gradually permeated and finally saturated by the solution. The cells are set up on a Wheatstone bridge and the electrical conductivity of the paper is taken at certain intervals of time and plotted graphically against time.

Clark and Durgin (May 15, 1918) used Okell's method with a few minor modifications, in an investigation by the Paper Section of the Bureau of Standards to determine certain factors relating to the present methods of testing paper for sizing and rosin content.

Besides these applications of the conductivity methods, several paper mills have undertaken research work to determine the actual value of the conductivity method over the old ink test, but little is known of the results of these individual investigations.

The set-up with the Wheatstone bridge is too complicated for the average paper mill laboratory, and the cell is simply connected in series with a voltmeter or amperemeter. An amperemeter is to be preferred due to its low resistance.

Valley Size Tester

A set-up of the conductivity method is being made by the Valley Iron Works, and the tester is known as the Valley size tester. The same cells and containers for the electrolyte as suggested by Okell are used. A thermostat is used for keeping the electrolyte at a constant temperature and two rheostats for regulating the current. The solution used is a n/I K and 20 per cent gylcerine and the cell is connected in series with a milliamperemeter.

This tester has been offered the paper industry as a tester for sizing and the advantage in this tester over the ink test is that it eliminates the personal element and is always operated under the same conditions. The ink test has unfortunately been adopted by the paper men as the only test for sizing and no differences have been allowed for the use of the paper tested. A writing paper has to be fast to ink, but a butcher's paper is not expected to be fast to ink but to blood; a parchment paper fast to water or alkali, and so forth. The sizing quality necessary for one grade of paper would be quite different from another, but the ink is used in all cases as a measurement of the degree of sizing. The Valley size tester is a step to a standard accurate tester, but the conductivity method is not as accurate as could be desired.

Average Figures in Sizing Tests

Below are some average figures on sizing tests obtained by the Valley size tester and the ink test, the furnish and the base weights of the paper tested:

Grade	Sulphite, %	Groundwood, %	Size lb.	Size %	Alum, lb.	Base weight lb.	Ink test, sec.	Valley test, sec.
Butcher No. 1...	80	20	50	4.1	50	40	288	85
Buecher No. 2...	60	40	40	3.3	40	40	990	151
Butcher No. 3...	40	60	30	2.5	30	60	630	372

These results are rather confusing and any opinion as to the real fastness of size of these papers cannot be concluded. The ink test shows a decrease in the sizing qualities with the decrease in sizing materials and grade of furnish, but the Valley size tester shows the reverse. The ink test shows a decrease in sizing of 65 per cent between the two grades, No. 1 and No. 2, and the Valley size tester shows a corresponding increase of 78 per cent; between grade No. 2 and No. 3 the decrease with the ink test is 36 per cent and the increase with the Valley size tester is 147 per cent.

Tests on Butchers No. 1 and No. 2

Ink tests and sizing tests performed with the Valley size tester on Butchers No. 1 and Butchers No. 2 show the following average figures over a long period of time:

	Butchers No. 1		Butchers No. 2	
	Valley tester sec.	Ink test sec.	Valley tester sec.	Ink test sec.
	106	2,040	227	868
	105	2,850	180	1,155
	97	2,205	155	990
	95	2,700	181	690
	121	2,830	124	900
	105	2,100	183	830
	117	.....	120	...
	118	.....	213	...
	111	.....	...	...
Average:	106	2,400	176	936

Two Possible Explanations

The two possible explanations of these reversed results obtained with the methods are:

1. The ink has a more rapid penetrating action on the ground wood than on the sulphite as compared with n/I KCl solution used in the Valley size tester.
2. Differences in the degree of penetration taken for endpoint by the two methods.

One of these two explanations, the second, is the more logical. In ink case tests the endpoint is taken when the ink is evenly penetrated through the whole piece of paper exposed to the ink. In the Valley size tester the solution first penetrates the weakest point in the paper, pinhole or its like, a short circuit is obtained, and the amperemeter registers a decrease in the resistance. The solution is now, instead of soaking evenly through the paper as in the case of the ink test, soaking in the edges around this weak point and in this way boring it up. When the endpoint is reached the rest of the paper exposed might not be nearly saturated and this weak point be the only place where the solution is penetrating through. The endpoint on the Valley size tester is 160 M. A. and the maximum reading on the amperemeter without any paper between the cells is 200 M. A.

In other words at the endpoint of 160 M. A., a result is obtained of the resistance for penetration, of the solution used, of the weaker points in the paper and not the whole piece itself, and this can hardly be taken as an expression for the sizing qualities. This evidently means that in order to get a fair expression of the sizing of this tester a close sheet has to be available.

Sizing tests done with the Valley size tester on the same grade and same furnish and base weight but of different formation prove this statement.

	Maximum	Minimum	Average
Close formation	44 sec.	32 sec.	38 sec.
Wild formation	37 sec.	8 sec.	23 sec.

*Jun. Memb. TAPPI. Neboosa-Edwards Paper Company, Port Edwards, Wis.

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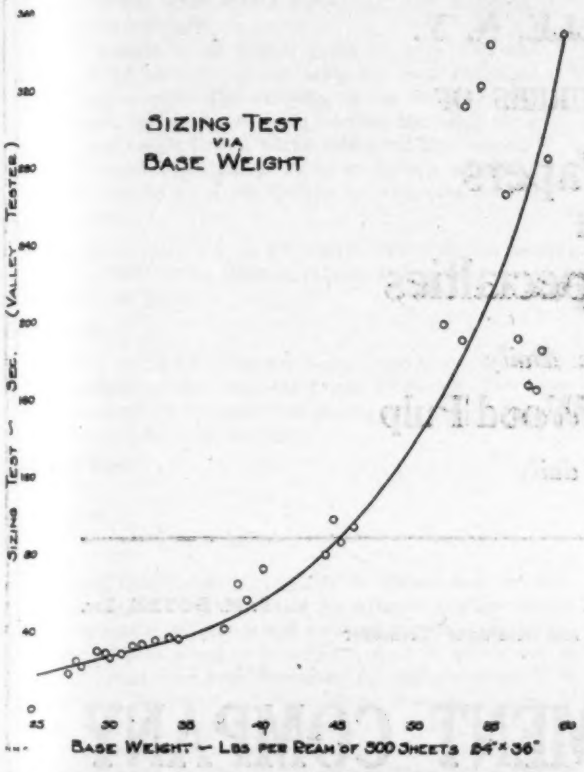
The two samples tested by the ink showed the same sizing. This would indicate that the uniformity of the formation has a large influence on the result from the Valley size tester.

Since paper of different furnish will show a different resistance at the saturation point, the endpoint 160 M. A. will represent a different degree of penetration for different furnishes. This would mean that different grades of paper cannot be compared as to sizing by means of the Valley tester.

The foregoing regarding the influence on the results in paper of different formation and furnish would explain the reason why the



grade Butchers No. 2 would show a higher sizing than Butchers No. 1 in spite of the fact that Butchers No. 2 has only 40 pounds (3.3 per cent) of size per beater and Butchers No. 1 has 50 pounds (4.1 per cent). The explanation would be that Butchers No. 2 is a closer sheet than Butchers No. 1, due to the larger amount of ground wood which has a tendency to fill up the spaces between the sulphite fibres. Grade No. 3 shows a still higher sizing for the same reason. Beside the different formation the furnish is different and therefore the endpoint 160 M. A. does not indicate the same degree of penetration.

Maximum and Minimum Results

Following are some of the maximum and minimum results obtained when testing the same grades of paper for sizing:

No. of readings on the same grade of paper	Minimum sec.	Maximum sec.	Difference %
27	96	186	94
39	82	250	205
33	60	146	143
27	60	222	207
58	86	210	144
43	111	270	143
27	92	222	141

In other words, in testing the same grade of paper of the same base weight fluctuation of 154 per cent in the results obtained can be expected. From the foregoing the following conclusions can be made:

1. The Valley size tester cannot be used for testing the sizing qualities of different grades of paper.
2. In order to get a reliable test on the same grade of paper the formation and the furnish has to be absolutely uniform.
3. The factors greatly influencing the results on the Valley size tester are formation of the sheet and the furnish. Beside these two, the base weight has, of course, a large influence, which will be taken up later in this paper.

Results by Different Operations

In this connection it might be of interest to examine the results obtained from the same paper by different operators in using the ink test and the Valley size tester. A series of mill tests were made to determine to what degree it was possible to cut down the amount of alum in the beaters. The alum was cut from day to day from 75 pounds per beater down to 37 pounds per beater and samples taken for each hour to be tested for sizing. Operator A tested each sample in the Valley size tester and with the ink flotation test. The average of the results for each set of samples was confusing when compared with each other, and with the two methods used for determining the sizing. It was decided that operator C should check operator A's result on the Valley size tester, and operator B should check the results from the ink test.

Here is what they got:

Alum		Operator A		Operator B	Operator C
lb.	%	Ink Test	Valley test	Ink test	Valley test
75	6.3	4	1	4	3
60	5.0	1	2	2	1
50	4.1	2	4	3	4
37	3.0	3	3	1	2

The foregoing figures represent:

1. Best
2. Next best.
3. Next poorest.
4. Poorest.

The only conclusion that could be made was that one was as good as the other in sizing.

Influence of Base Weight on the Sizing Tests

In order to get an opinion of the relation between sizing qualities of different base weights with the same amounts of sizing agents and with the same furnish a run of paper was made on an experimental paper machine. The furnish of the paper was the same as in the grade Butcher No. 1, and the scope of the run was to determine the variation in sizing for this grade with varying base weight. The amount of sizing agents was 5 per cent size and 5 per cent alum. The stock was beaten to resemble Butcher No. 1 as much as possible and the formation of the paper made was the same because the stock was run from the same beater.

The paper was tested for sizing in the Valley size tester and ten separate samples were tested for each base weight. Following is a table covering the average results of these tests:

Base weight, lb. (24x36)	Average	Base weight, lb. (24x36)	Average
27.2	20	38.2	66
27.6	26	44.8	100
28.0	25	45.2	89
28.8	32	45.6	98
29.6	30	52.0	200
30.0	29	53.2	192
30.8	30	53.6	313
31.6	32	54.4	321
32.0	34	55.2	345
33.2	35	56.0	265
34.0	38	56.8	192
34.4	38	57.6	169
37.6	43	58.0	167
38.8	57	58.4	187
40.0	74	58.8	284
44.0	82	60.4	348

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These results are plotted on Curve Sheet 1. The curve can be divided into three parts:

1. The increase in the sizing quality with the increase of the base weight from 25 pounds to 35 pounds.
2. The increase in the sizing quality with the increase of the base weight from 35 pounds to 50 pounds.
3. The increase of the sizing quality with the increase of the base weight from 50 pounds to 60 pounds.

As shown in the graph the curve has different directions:

1. 25 pounds to 35 pounds being a straight line with an increase of the sizing with 2 seconds for each additional pound of base weight.
2. 35 pounds to 50 pounds being a curve with an crease of 8.5 per cent of the sizing for each additional pound base weight. This evidently invites the use of the formula for compound interest to calculate the sizing for a certain base weight from a known sizing and base weight.
3. 50 pounds to 60 pounds shows an increase of 9.3 per cent and here, as for 2, the formula for compound interest can be used.

This formula is: $a = p\ (1 + r)^n$ where a is the amount sought; p is the principal; r, the interest expressed in decimals; and a is the number of terms.

For example:

A paper was tested for sizing and it was found to be 140 seconds. The base weight for the same paper was 50 pounds. The sizing for the same paper of 40 pound base is sought.
These factors are found in the table.

$$140 = x(1 + 0.086)^{10}$$

$$x = \frac{140}{(1.086)^{10}}$$

$$\log x = \log 140 - 10 \log 1.086 = 1.78783$$

$$x = 61$$

Forty pound base weight is suggested as the standard for comparison; that means that paper tested for sizing of any base weight has to be reduced to 40 pounds and reported as such. The factors $(1 + 0.086)^n$ for 35 pound to 50 pound, and $(1 + 0.093)^n$ for 50 pound to 60 pound, have been determined for different values of n.

For reducing the results of paper of base weight of over 50 pounds or below 35 pounds, they must first be calculated to 50 pounds or 35 pounds, respectively. For paper over 50 pounds, the reduction is done by dividing by the corresponding factor, and the figure so obtained divided by 2.280. For paper below 35 pounds, add 2 seconds for each pound up to 35 pounds and divide by 0.656.

The following table shows the factors for each base weight for converting the result to 40 pound base:

1. 35 pound to 50 pound $a = x(1 + 0.086)^n$		2. 50 pound to 60 pound $a = x(1 + 0.093)^n$	
n.	$(1 + 0.086)^n$	n.	$(1 + 0.093)^n$
35	0.656	50	1.000
36	0.702	51	1.093
37	0.767	52	1.193
38	0.833	53	1.295
39	0.900	54	1.560
40	1.000	55	1.560
41	1.086	56	1.705
42	1.179	57	1.863
43	1.280	58	2.036
44	1.390	59	2.225
45	1.510	60	2.432
46	1.640		
47	1.781		
48	1.935		
49	2.100		
50	2.280		

This table shows that a paper of 48½ pound base weight shows twice as high sizing with the Valley size tester as a paper of 40 pound base weight, and a paper of 58 pounds four times as high. In examining the curve the direction indicates that at a base weight of about 65 pounds the endpoint 160 M. A. would never be reached. This is due to the fact that the resistance at the penetration for this base weight is higher than the resistance corresponding to the endpoint 160 M. A. The direction of the curve will, of course, be different for differently sized papers and for different grades, and this curve is merely to show what influence the base weight will have in the testing of the sizing with the Valley size tester.

Summary

1. Some comments as to the factors influencing the results obtained for sizing tested with the Valley size tester are given.
2. The factors that influence these results are, in addition to the amount of sizing agents, the base weight, the furnish and the formation of the sheet tested.
3. A curve is given showing the increase in sizing test with the increase in base weight for a hard sized paper, the furnish being sulphite 80 per cent and ground wood 20 per cent.
4. Some results are given that indicate that the Valley size tester cannot be used for comparing paper of different grades.
5. In order to obtain a reliable test of the sizing fastness of a sheet of paper to be compared with one of known sizing, the base weight, the formation and the furnish have to be the same.

Ink Flotation vs. Valley Size Tester

By M. L. Caust*

These tests were done quite carefully to satisfy two differently interested parties. The Valley tests were made according to standard directions (35° Cent., 160 milliamps.). The flotation tests were made with ink prepared according to the formula of C. F. Sammet, the reading being taken as soon as the ink showed through.

Relation Between Valley and Flotation Tests

The curves on Fig. 1 and Fig. 2 show the relation between the two methods. From these curves it may be concluded that the two methods show a general agreement, except, of course, that a paper tested by the flotation method shows a penetration in about two to two and a half times as many seconds as is obtained by the Valley method. It is also seen from the curves that, in particular instances, the factor of flotation Valley can be as low as 1.5 or as high as 3.5.

Comparative Accuracy of the Methods

In order to determine the superiority, if any, of the Valley tester with regard to the accuracy of the results, a number of tests were made as shown in Table 1.

TABLE 1

			Valley			Flotation		
Ream weight, 25x38—500	Kind	Ash, %	No. of tests	Average sec.	Max. variation from average, %	No. of tests	Average sec.	Max. variation from average, %
63	Book	20	10	16.3	12	10	26.8	13
53	Book	18	4	3.6	8	4	7.5	13
65	Book	18	3	8.6	3.5	3	52.7	11
60	Book	19	3	5.0	6	3	21.3	12
59	Book	19	4	19.5	14	4	53.1	17
					Av. 9			Av. 13

These results show that it is possible to make a set of tests on the Valley tester and check results with an average maximum variation of about 9 per cent, while by the ink flotation method one may expect a slightly higher variation.

*Jun. Memb. TAPPI. Tiletson & Hollingsworth Company, Mattapan, Mass.

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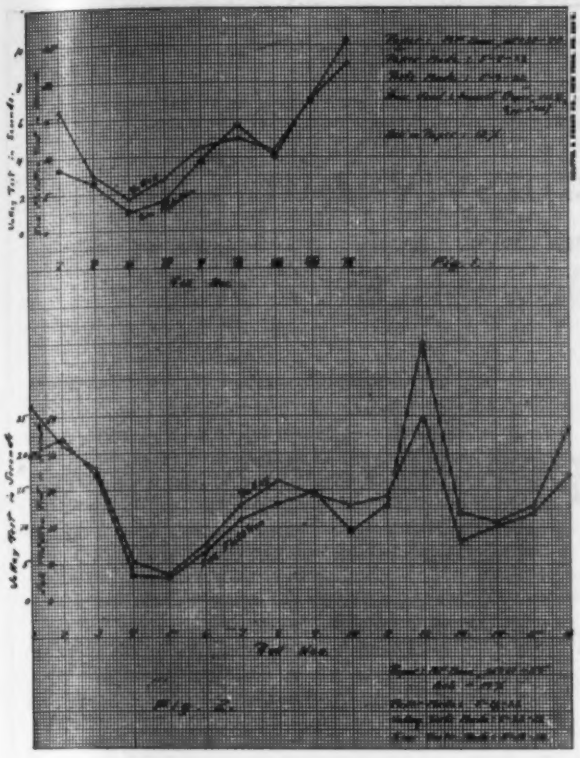

Checking of Tests

In Table 2 are given the results of tests repeated on the same papers after several days.

TABLE 2

Ream weight, 25x38—500	Kind	Ash, %	Date of test	Valley: Test sec.	Valley: Difference sec.	Valley: Variation, %	Flotation: Test sec.	Flotation: Difference sec.	Flotation: Variation, %
50	Antique book	18	.....	8.8 8.1	0.7	9	19 11	8	73
59	Book	18	5-2-22 5-5-22	7.5 8.4	0.9	12	14.1 21.7	7.6	54
60	Book	13	4-28-22 5-5-22	5.4 5.0	0.4	8	21.7 21.3	0.4	2
					Av.	10		Av.	43

Evidently, if it is a question of retesting a sample within a few days, the Valley method is by far superior to the flotation method.

Valley tests repeated after several months do not show such agreement, however, as seen from Table 3.

TABLE 3

Ream weight	Kind	Ash, %	Date of test	Valley test sec.
60	Book	13	4-29-22	21.2
			12-29-22	73.5
50	Book	20	5-25-22	1.3
			12-29-22	2.7
59	Book	19	5-5-22	8.4
			12-29-22	29.3
56	Sulphite bond	..	10-24-22	61
			11-17-22	101
			12-24-22	106

Lubrication and Its Relation to Paper Making

By A. A. Capelle*

During the last half century, man's achievement in the field of science, invention and industry is astounding when one considers what has been accomplished in such a comparatively short space of time. The results are attributable to applied science, through man's intelligence, ingenuity and industry. Applied science covers the great field of engineering of which there are numerous branches.

Those of you who can go back these fifty years, know that in those times the construction of a house or a paper mill was scarcely planned in advance in an intelligent way, but, was largely left to the ingenuity of the carpenter and brick layer. With the advent of the architect and engineer, greater and more economical results were accomplished in a much shorter space of time. One has only to walk through a paper mill built two score or more years ago, and then through one built at a much later period to realize this wonderful achievement.

Thirty-five years ago, two hundred and fifty feet of paper per minute was considered a remarkable speed for making news print. Illustrative of this remark, I recall an amusing incident, related to me by one of the pioneers in the paper industry in New England.

It happened in the period as stated, when paper making was in its infancy, and it was thought the limit of speed had been reached at two hundred and fifty feet.

Zebediah Whitely had a small mill down on a little stream, where his chief sources of power were an overshot water wheel for his pulp mill and an old type of straight line engine for his paper machine.

Zeb had built his own mill and was proud of the fact, and having spent the greater part of his years in paper making, he could hardly conceive that there could possibly be any improvements, further than his own accomplishments.

One day he was driving down to his mill, behind his favorite horse Dobbin, when he met Timothy Riley, also a paper maker, coming in the opposite direction en route to his mill. Tim drew his horse up short in the manner of some excitement, and without exchanging greetings, drawled out—"Say, Zeb, has you heard that Sol Smith is making news down at the Redfern mill at two hundred and fifty feet?"

"'Tain't possible," retorted Zeb and started to pull up his horse.

"But it is so," said Tim, "I seen it myself."

Zeb stood him down that it was an utter impossibility; that he had gone as far as any paper maker in the country in his paper mill and two hundred and twenty feet was the limit.

Tim remarked, "Well, Zeb, I don't want to take advantage of you, because you and me has been close neighbors and good friends for years, but if you won't take my word for it, I'll just bet my horse against old Dobbin that it's so."

Zeb looked at him, hesitated a moment, then reached over and they shook hands; so convinced was Zeb that it couldn't be done.

Being of a determined mind, he drove down to Redfern that very afternoon and strolled out into the machine room. He gazed at the machine complacently a few moments. Then with an expression of awe. It *was* going faster than he had ever seen a machine go; still he could not comprehend it, and pulling out his watch he counted the revolutions of a dryer. He did some figuring on an envelope for a moment, then he was seen to take a step backward, drop his watch on the floor, and tumble down on his knees. The machine tenders, seeing Mr. Whitely fall, and thinking

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he had been taken with sudden illness, ran to his assistance, and as they did so, he looked up at them with an expression of terror, and in a trembling voice, ejaculated, "My God, I've lost old Dobbin."

From Zeb and Tim's time we have seen the growth of the paper machine to wonderful proportions and tremendous speeds. From a standard width of about 90 inches and a maximum speed of two hundred and fifty feet in Zeb and Tim's time, we have reached the almost miraculous proportions of 219 inch widths and speeds over 1,000 feet per minute.

This wonderful development was accomplished by the machine builder and engineer, in collaboration with the practical paper maker, and who will say that the development will not go further. It may be not in size nor speed; but certainly in economies of operation, increased production and better grades of paper.

Economies of Operation

It is a well established fact, that between the coal pile, from which we mostly extract our power, and its ultimate delivery, at the point of useful work, in the average paper mill there is a loss of approximately 80 per cent. In other words, of the heat units taken from the coal, only approximately 20 per cent is converted into useful work. A large per cent of this is lost in the boiler room in various ways, chiefly through flue gases escaping up the chimney. Then there are the other losses, as you gentlemen well know, in radiation of heat in the steam line and in the engine itself.

Starting at the engine, on to the point where we make paper, our losses are two—"frictional" and "mechanical." As an illustration of mechanical loss I will cite the slippage of a belt, but of the two, friction is probably somewhere around 90 per cent of the loss.

We have seen refinements in the power plant, but what have we done about friction?

Until rather recent years, friction has been looked upon as a necessary evil, with the only cure to *pile on the grease* and *pour on the oil;* and when I say, "pour on the oil," I mean this literally.

I recall in my earliest experience in a paper mill, that the lubrication consisted of two oils—a heavy engine oil and a light engine oil, some tallow grease and a gear grease. They were cheap lubricants, and little attention was paid to their application.

Correct Lubrication

In recent years, hand in hand with the advances in other branches of engineering affecting the paper mill, has come *lubricating engineering*, which is to say *correct lubrication* put on a technical basis, which means the selection of:

(a) *The right grade of oil.*
(b) *Put in the right place.*
(c) *In the right way.*

For a moment let's analyze these three characteristics.

The first one—The Right Oil.

What is the right oil? The right oil is an oil that will establish and maintain a continuous film between a rotating shaft and the bearing surfaces which hold it in line.

To illustrate this, let's picture in mind two circles of slightly different diameters, one within the other, the distances between their circumferences being two thousandths of an inch. The inner circle is the shaft; the outer circle is the bearing; the space between them is the bearing clearance.

If the right oil is used in the proper way, these circles will not touch. The result being that what otherwise would be metal to metal contact, generating surface friction, is converted into fluid friction.

If an incorrect oil is used the circles will touch. It may be that the oil is of too light body—not suitable to the bearing pressure, and is squeezed out of the bearing, or it may be that the oil does not have the proper characteristics to resist high temperature, so that it thins out and escapes from the bearing or carbonizes, or it may not have the characteristics to resist water or dirt. These are only a few of the many possible cases.

The Right Oil

While we are analyzing the first characteristic—THE RIGHT OIL—let us apply the subject to a paper machine and take, for instance, a high speed fourdrinier news print machine, operated by the sectional electric drive.

In a lubricating sense, we have mainly four conditions to meet:

Firstly: wet, cold conditions on the fourdrinier and in addition heavy pressures on press parts.

Secondly: hot, dry conditions with moderate bearing pressures on the dryers.

Thirdly: excessively heavy bearing pressures at the calender.

Fourthly: high speed, light bearing pressures with scant clearances on the motors.

Analyzing these in turn:

The Fourdrinier and Press

The fourdrinier and press parts will require an oil that will resist the abrasive action of water from the shower pipes and other sources and will not congeal under the influence of the low temperature of the cold water nor thin out on account of heavy pressures permitting metallic contact and hot bearings.

The dryer part will require an oil that will resist the carbonizing and thinning out effect of the induced heat from the steam heated dryer and will be of sufficiently heavy body to take care of the slow speed at moderately heavy pressure. The same analysis, except high speeds, obtains for the felt bearings.

The calenders require an extra heavy-bodied oil and one of a tenacious character, that will adhere to the bearing surfaces, notwithstanding the influence of moderate speeds and heavy pressures. It should also be an oil that can be filtered and used repeatedly, since it is common practice today to catch the oil drip of the calenders, filter and use it over and over again.

The motors require a light bodied oil of great endurance, since these bearings are invariably of the ring oiling type, with small clearances, very finely machined shafts, and the oil is circulated around the shaft at high speed.

The Right Place

Now, coming to the characteristic—*the right place.*

It is obvious that oil to correctly lubricate must be distributed over the entire frictional surface.

On every machine there is the *right place* to apply the oil in order to insure maximum lubricating efficiency.

In a steam cylinder, for example, the oil must be introduced into the steam line through an atomizer where it may be broken up and distributed by the steam to all internal frictional surfaces. On a bearing the oil must be introduced where the full clearance will permit its admission. This point is affected by direction of belt pull, or weight or thrust load. Unquestionably the right place for oil is in the bearing, not on the floor—but how many, many times, do we see puddles of oil around our machines.

The Proper Way

The third characteristic—*the right way*—involves the application of the oil to the bearing.

Hand oiling of bearings is wasteful. The human element in this method of oiling involves a risk from neglect, a waste of oil, and an unnecessarily high cost for lubrication. Until lubrication in a paper mill was put on a technical basis there were very few automatic devices for the proper application of oil, other than ring-oiling and collar-oiling bearings. More recently frequent use is being made of other types of automatic oilers, such as dropfeed cups, wickfeed cups, and bottle oilers. The uses of these appliances influence the quantity of oil required for lubrication.

The design of a bearing in relation to the bearing pressure and speed of rotation is most important, and particular attention is being

MILTON E. MARCUSE
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BEDFORD PULP & PAPER CO.

Paper and Pulp Mills of Bedford Pulp & Paper Co. at Big Island, Va.

Manufacturers of

BUTCHER'S FIBRE

Special Papers for Fibre Containers

General Offices: RICHMOND, VA.

Paper and Pulp Mills at Big Island and Coleman Falls, Va.

paid to the forms of grooving. A great many types of grooving which the mill mechanics use, have a deterrent effect on the distribution of oil rather than assisting in spreading the oil over the entire bearing surface.

The lubrication manufacturers have given this matter a great deal of attention, with the result that certain types of grooving are found to be correct for certain specific cases.

I have spoken to you respecting the correct lubricants for certain specific requirements for a paper machine, now I want to tell you something about the special characteristics concerning these lubricants.

Correct lubrication of the paper mill must involve a wider choice of lubricants than used to be considered necessary, but it has been demonstrated practically that wherever possible it is economical to use high grade lubricants. By the term "high grade lubricants" I mean:

High Grade Lubricants

(a) Crude oils, specially selected with regard to their ultimate use.

(b) Oils that are refined by processes which prevent their lubricating characteristics being destroyed.

(c) Oils that are carefully refined and treated with the ultimate object of giving each oil definite and uniformly maintained characteristics.

It has been demonstrated in recent years, first, by experiment, then by practical usage, that high grade oils, which are sometimes called expensive, are in fact low cost oils, for the reason they are the correct oils. That is, they exactly suit the conditions under which they are to be used.

A less quantity of a high grade oil may be distributed over a larger area of bearing surfaces, and last longer than an inferior grade oil. Finally the high grade oil is thoroughly reliable, that is, barrel after barrel runs uniform with respect to quality, body and other characteristics. A cheap grade of oil lacking in these qualities will cause trouble time and again.

Is it not most essential then that for the highest economies in paper making, that we use high grade lubricants applied to the bearings in the right place and in the right way?

In summing up the lubrication of the paper mill, I want to call your attention to the conditions which are so vitally affected by improper lubrication. When I say improper lubrication it includes not only the use of low grade lubricants, but also improper methods of application.

(a) Cost of power.

The greater the friction load, the more coal must be used; or conversely, if you can reduce your friction load, you effect a saving in coal.

(b) Loss of production.

The paper mill being one continuous process for making paper, from the wood pile or rag room to the finished roll or ream, it is of vital importance that no one part of the mill shall be shut down for any great length of time. Shut downs are expensive, as you gentlemen well know. The breaking of a main line shaft will close down a mill for quite a while. I quite recently encountered a case of this kind. It was in a basement. The babbitt had run out of a bearing, adjacent to a main belt drive. The belt pull snapped the shaft as soon as the bearing let go.

I dare say some of you gentlemen have had the disagreeable experience of having paper returned to you, on account of grease spots. This could not occur if the lubricant had been properly applied to the bearing causing the trouble.

(c) Cost of repairs and certain supplies.

Cost of repairs is or should be a matter of grave concern to every mill owner as it involves large items of labor and material. Almost without exception these items are attributable to faulty lubrication. In a mill that has been correctly lubricated, the saving in cost of repairs frequently exceeds the cost of oil. Probably next in importance in the matter of saving, attributable to correct lubrication, is the economy obtained in the life of belts. As you very likely know rubber has an affinity for oil. A line shaft bearing that has been flooded with oil will lose all the oil in excess of its reservoir capacity, and this oil will invariably creep along the shaft, down the hub of the pulley and the arms, out on the rim, by centrifugal force, until it meets the belt, which readily absorbs the oil and ruins the belt in the course of time. Other belts are equally affected by oil dripping on or splashing against it.

The wire, the press felts and the dryer felt have their lives shortened by improper lubrication of the roll bearings; if the bearings of the table rolls are not properly lubricated, the rolls will not turn and therefore are worn flat by the friction of the wire, necessitating replacement of rolls and wire.

Stuff Pumps

(d) Depreciation of Machinery.

With hardly an exception in any mill, the stuff pumps are located in the basement, where they receive scant attention from the oiler, and operating at slow speed, are frequently left to take care of themselves. In many cases you can hear the pump long before you see it, all the connections being loose and worn. These pumps cost money, and if they are properly cared for in the lubricating sense, they would probably last quite as long as the paper machine. I have only singled this out as an instance, but in general it applies to most any piece of machinery in the mill, that is not properly lubricated.

It is certainly quite remarkable how some of the ancient paper machines we see in old mills hang together and continue to make salable paper, but one by one they drop out of condition, whereas if they had been properly lubricated and kept mechanically fit they might have gone considerably further, or at least they would have had a re-sale value, whereas if the mill in question is shut down the machine has barely a junk value since it could not be moved any distance and set up again in workable condition. I might make an exception in regard to dryers, they seem to go on forever.

New Machinery

In turning from old machines to machines in the process of building, it is not my belief but my conviction that more attention than ever is going to be paid to the matter of lubrication in the designing of new paper machinery. This is apparent by the desire of the paper machine builders expressed in recent years for consulting with the technical departments of our large lubricating companies.

It is also evidenced by the demand from the paper mills for lubricating engineers, to advise and consult with the superintendents and master mechanics for reestablishing their mills on a correct lubricating basis.

All this indicates that lubrication as an applied science has already taken its place alongside of other useful and economical branches of engineering.

Conclusion

The cost of the investment for a machine is proportional to its return value, and the cost of lubrication should be considered from the same viewpoint.

Compared to total manufacturing costs, the cost of lubrication is very small indeed, but the application of Correct Lubrication produces a reduction in manufacturing costs amounting, in some instances, to many times the cost of lubrication. This reduction in manufacturing costs is the dividend on lubrication as an investment.

MARTIN PAPER CO. TO INSTALL PAPER MACHINE

Martin Pulp and Paper Company, Norwood, N. Y., has signed a contract with the Bagley & Sewall Company, Watertown, N. Y. for one 96-inch cylinder machine with Hawley attachment. It is planned to have this machine in operation in October or November of this year.

THE PARKER-YOUNG COMPANY

MANUFACTURERS

ENVELOPE PAPER

OUR SPECIALTY

SULPHITE BONDS

Pemigewasset—White and Colored
Montwhite—White only

ENVELOPE

Pemigewasset—White Wood
Montwhite—White Wood
Profile—Manila

MANILAS

Granite
Grafton
Lincoln
Profile
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Commerce

FIBRES

Lincoln Fibre
White Fibre

We also manufacture

BOX SHOOK

at Orleans, Vt., and Lisbon, N. H.

Pulp and Paper Mill
at Lincoln, N. H.

General and Sales Offices
131 State Street, Boston, Mass.

Steam Economy in Paper and Pulp Mills

By E. P. Gleason*

Economy in the generation and use of steam in Paper and Pulp Mills deserves more serious and careful attention. Boiler rooms and distributing systems have been regarded as necessary evils and have been sadly neglected in the past. The fuel shortage that existed during the war period and the necessity of economic production since that time, have directed more attention to this important phase of the manufacture of paper and pulp.

These figures show that steam power is 36 per cent of the total conversion cost and the electric power about 11 per cent making a total power cost of nearly 50 per cent of the total conversion. Labor is about 25 per cent of the conversion cost.

Much is heard of the cost of lighting and lubrication.

You will note that electric lamps cost 0.1 of 1 per cent. Lubricants cost 0.14 of 1 per cent and are comparatively small items. All possible savings should be made in every line, but in many mills the energy spent in saving lamps and oil could better be spent in saving steam and power.

The steam cost is divided into two distinct parts.

(a) The generation of steam in the boiler room.

(b) The distribution and use of steam in the mill.

Generation of Steam in the Boiler Room

Credit is due the News Print Service Bureau for the pioneer work in standardizing boiler room costs and efficiency in the past two years. We understand that this service which heretofore has been available to members only is now available to paper and pulp mills not on news at a nominal cost. Boiler room methods and efficiencies are comparable for all classes of mills and we feel that this service will be of great benefit to the paper industry.

Table 3 shows Daily Boiler Room Efficiency. Inasmuch as Port Edwards and Nekoosa are very similar in size and equip-

*Memb. TAPPI. Chief engineer, Nekoosa-Edwards Paper Company.

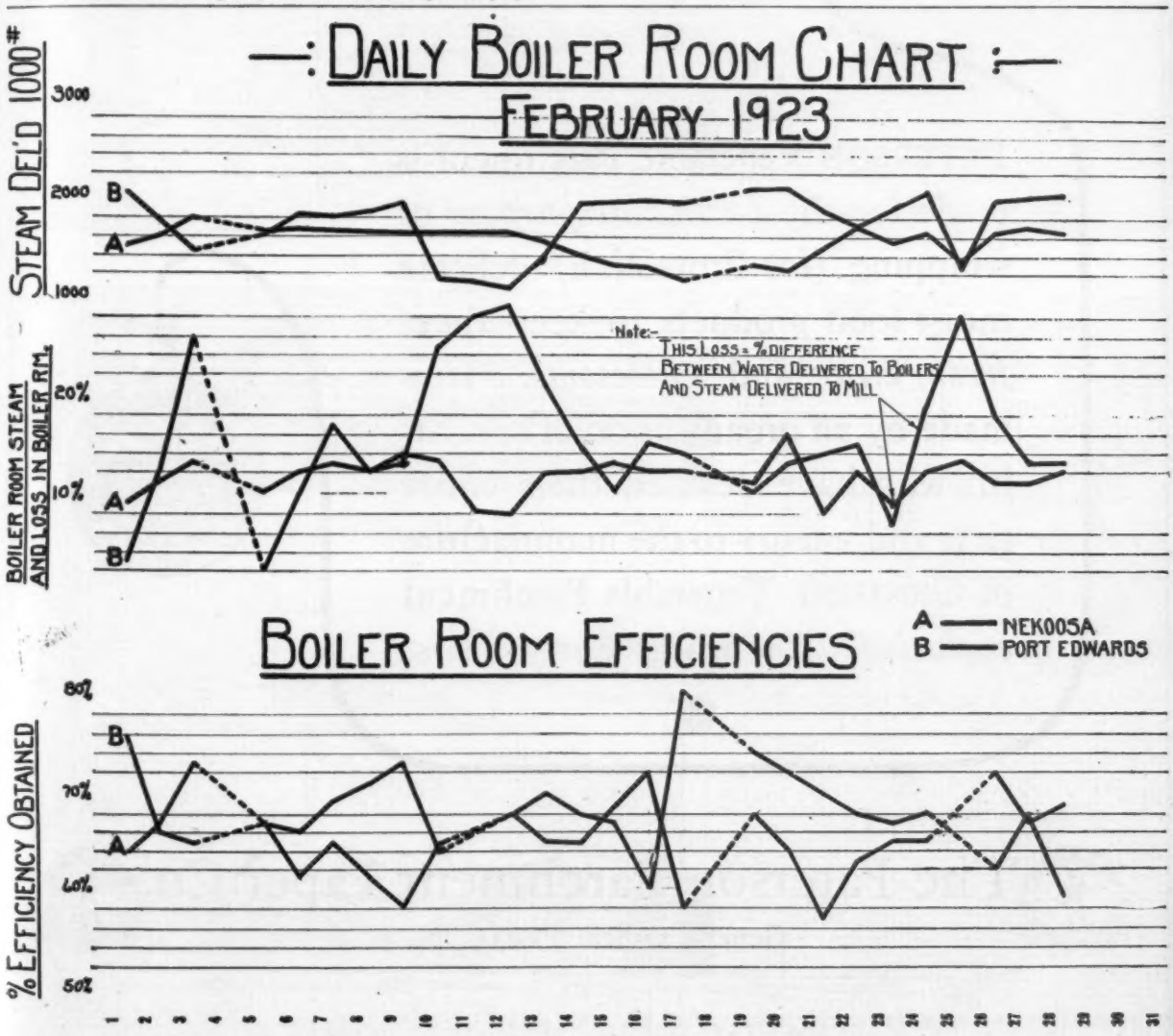


CHART 2

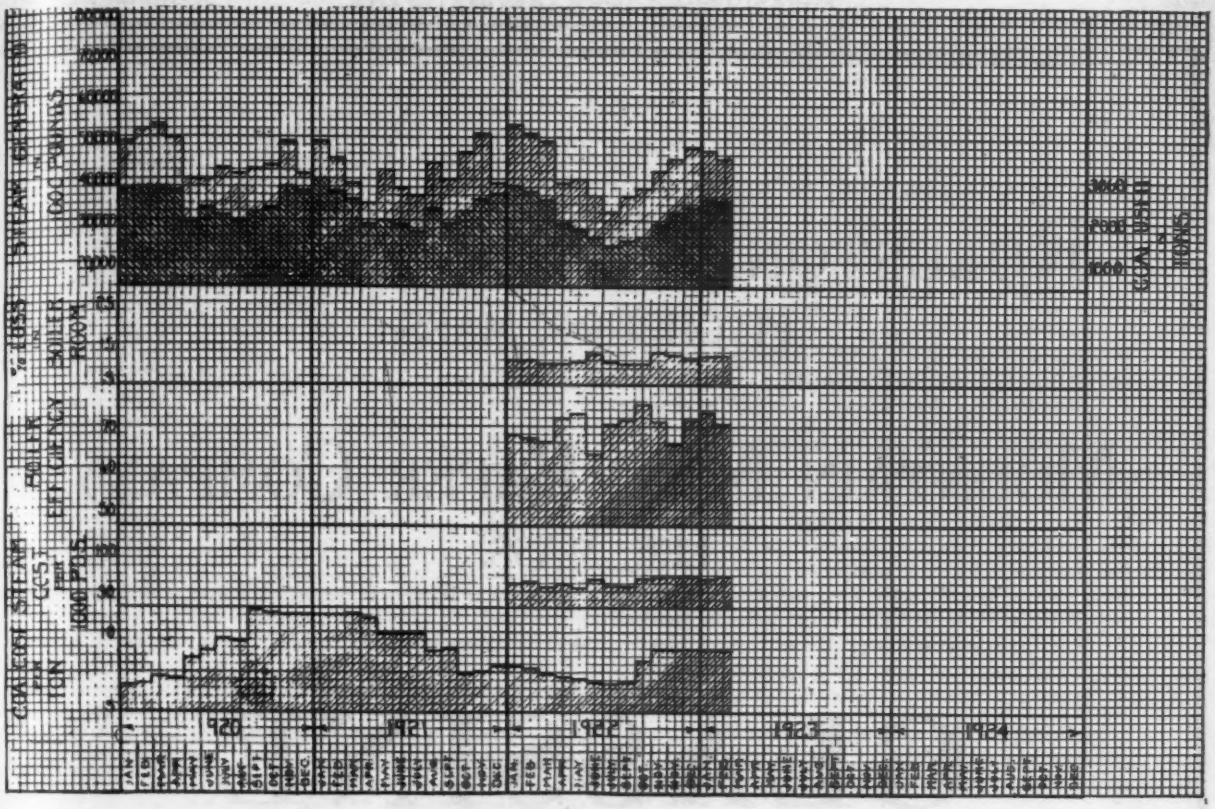
PARCHMENT WRAP
Keep Fresh Foods Fresh
FOR PROTECTION

FOR every purpose that paper is used there is *one grade* recognized as superior to all others — because it is made for that *particular* purpose.

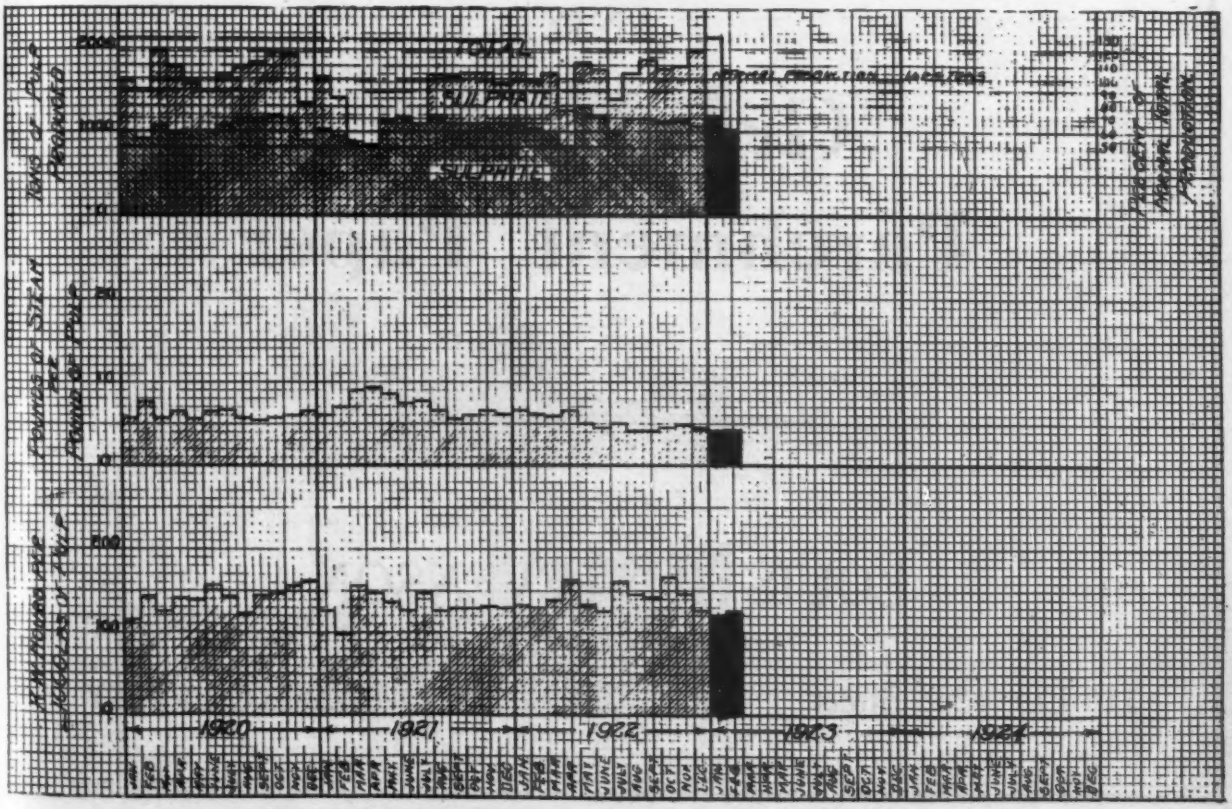
PATERSON Vegetable Parchment is made for the *particular purpose* of wrapping (for Protection) delicate moist food products to keep them *fresh, clean* and *wholesome.* It is made by an organization of specialists who have devoted their entire time and energy to the manufacture of GENUINE Vegetable Parchment *exclusively* for nearly Forty Years.

CLEAN FOOD ASSOCIATION
Licensed
CLEANLINESS & QUALITY ALWAYS
Member
OF AMERICA

The Paterson Parchment Paper Co.
General Office: PASSAIC, N. J.



NEKOOSA BOILER ROOM CHART



NEKOOSA SULPHITE AND SULPHATE MILL PRODUCTION

ROLLSTONE PAPER COMPANY
FITCHBURG, MASS.

MOUNTAIN MILL PAPER COMPANY
LEE, MASS.

GLASSINE
AND
Greaseproof Parchment Paper

LOUIS T. STEVENSON
President and Sales Manager

110 East 42nd Street NEW YORK CITY

TABLE 1
PAPER MILLS

	Per cent
Labor	28.39
Repair labor	5.78
Repair materials	3.62
Roll and plates	0.18
Belting	0.64
Supplies	0.51
Lamps	0.13
Machine clothing	10.24
Lubricants	0.34
Power (steam)	36.27
Power (electric)	10.72

TABLE 2
SULPHITE MILLS

	Per cent
Preparing wood	23.00
Labor	16.70
Repair labor	3.45
Repair materials	6.39
Screen plates	0.19
Belting	0.17
Supplies	0.40
Lamps	0.10
Lubricants	0.14
Power (steam)	36.25
Electric power	11.65
Frt. on sulphite	0.49

ment the comparative results are posted in each boiler plant each day.

Chart 1 shows the monthly charts which are posted at each plant.

Chart 2 shows daily records in graphic form. This is more easily read by the firemen than the tabulation in Table 3.

It is no easy task to obtain good boiler room records. Flow meters, thermometers, coal scales, coal quality and load conditions vary and it is practically necessary to have one man devote his entire time to this work. Incomplete or inaccurate records are worthless.

We wish to emphasize the need for more intelligent consideration of hog fuel. In many places it is a by-product of the wood room and it not paid for by the boiler room. We measure the steam made from the wood from refuse and credit the wood room with the market price of the equivalent coal. Formerly the refuse was free. When peeled logs or wet barking came the boiler room was the "goat" because it had to buy high priced coal to replace the free hog fuel. Now the boiler plant does not suffer from changes in wood room conditions. The Waste Committee is working on the handling and burning of hog fuel and are getting considerable test data. Tests made at Nekoosa-Edwards mills have shown that efficiency of 65 to 70 per cent can be obtained regularly but that without boiler meters and CO_2 recorders efficiencies of 50 to 60 per cent are usual. It is very easy to get poor efficiencies with hog fuel and the design and operation of hog fuel furnaces needs more attention.

Distribution and Use of Steam in the Mill

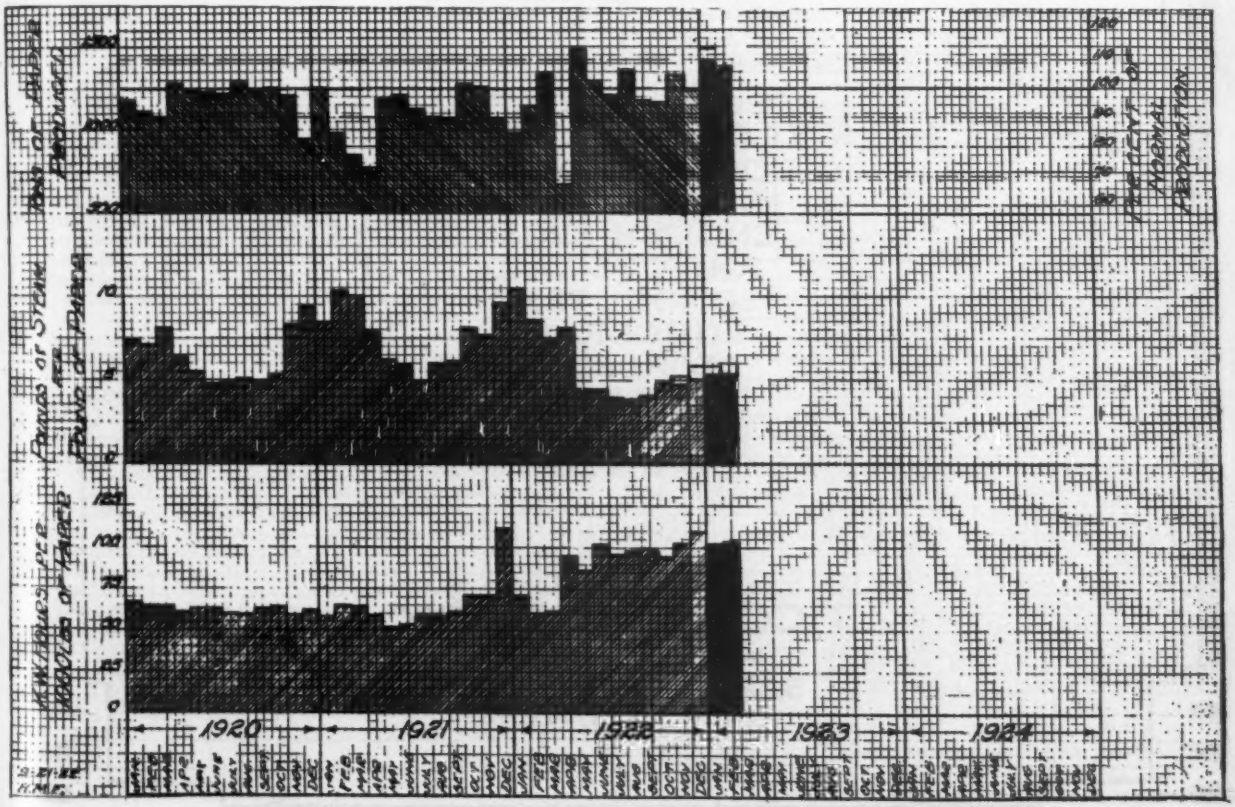
A survey and plan of the steam piping in the average mill will show (a) duplicate lines (b) uncovered lines, especially the small ones to flat iron heaters, water barrels, etc. (c) lines of the wrong size and with too many fittings to give heat results. The remedy is obvious. Flowmeters to major departments and a study of Sunday boiler load will show the big losses. Weed out the duplicate lines and cover every inch of those finally left.

Steam is used for heating and process.

(1) Heating steam is too often live steam where exhaust from non-condensing or extraction units would save money.

Heating Costs for One Mill for One Year

Six months	No Heat	Heat	Increase
Coal tons	11,174	16,036	4,862
Tons per month	1,862	2,672	810
Cost	$142,837	$191,275	$48,418
Cost per month	$23,809	$31,879	$8,070



JOHN EDWARDS-PAPER MILL PRODUCTION

TICONDEROGA PULP & PAPER CO

MANUFACTURERS OF

FINE QUALITY BOOK PAPERS

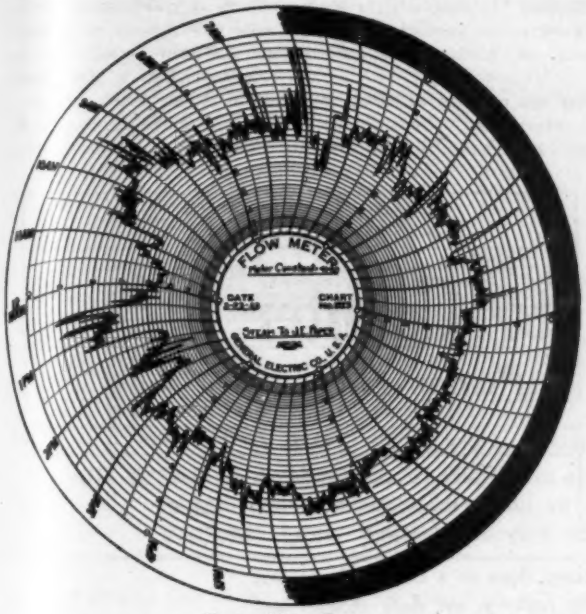
AND

SODA FIBRE

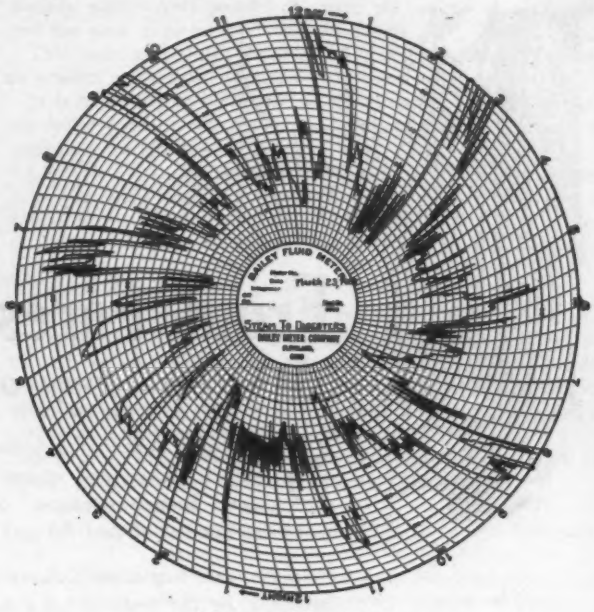
SPECIAL MAGAZINE
SPECIAL COVER
COLONIAL OFFSET
MACHINE FINISH
ENGLISH FINISH
ANTIQUE LAID
SCHOOL TEXT
LITHOGRAPH
LEGAL BOOK
EGGSHELL
COATING
MUSIC

MILLS AT
TICONDEROGA, N.Y.

SALES DEPARTMENT
522 FIFTH AVENUE
NEW YORK, N.Y.



PAPER MILL STEAM



SULPHITE MILL STEAM

This shows that for six heating months an average of 810 tons of coal was burned each month for heating at a cost of $8,000.00 per month. It is not uncommon to have the pounds of steam per pound of production increase 100 per cent during the cold winter months. It is not uncommon to find doors and windows open on warm days in the spring and fall and to find rooms uncomfortably warm at all times during the heating season.

One remedy is a heating and fire inspector, whose duty is to

NEKOOSA-EDWARDS PAPER CO. — BOILER ROOM EFFICIENCY

MONTH FEBRUARY — MILL POST FIGURES — FIG-3

Date	COAL IN POUNDS P.S.	COAL IN POUNDS MIX.	EVAPORATION FROM AND AT 212° P.S.	EVAPORATION FROM AND AT 212° MIX.	EFFICIENCY IN % P.S.	EFFICIENCY IN % MIX.	STEAM TO BOILER ROOM HEAD LINE P.S.	STEAM TO BOILER ROOM HEAD LINE MIX.	P.S.	
1	218230	190855	10.67	8.7	76	64	180	152		
2	227100	185250	9.08	9.1	66	67	168	148		
3	219000	189707	8.9	10.0	65	72	210	186		
4	91500	65183					189	96		
5	178462	205935	9.15	9.1	67	67	164	147		
6	215815	205082	9.00	8.4	66	61	176	145		
7	212970	205564	9.46	9.	69	65	161	186		
8	214834	192085	9.00	8.4	71	61	160	147		
9	215923	224299	10.10	8	73	58	160	146		
10	258700	193100	8.76	9	64	65	167	167		
11	176806	193862					159	132		
12	195769	187338	9.3	9.3	68	68	194	152		
13	247880	184006	9.4	9	70	65	176	170		
14	238188	176277	9.2	9	68	65	184			
15	263860	146016	9.0	9.5	67	69	154	143		
16	256900	144078	8.15	9.8	60	72	164	118		
17	212787	142791	10.84	8	80	58	204	118		
18	77200	62779					165	92		
19	214541	184015	10.2	9.3	74	68	169	139		
20	260240	162761	9.75	8.7	72	64	194	176		
21	210278	205682	9.5	7.9	70	57	167	159		
22	205650	216436	9.2	8.6	68	63	176	169		
23	248232	185187	9.0	9	67	65	182	118		
24	262665	186919	9.28	9	68	66	210	157		
25	200650	172160					170	161		
26	285086	183715	8.4	9.9	62	72	195	176		
27	243395	206662	9.24	9.2	68	67	196	152		
28	277515	186856	7.2	9.4	52	69	202	167		
29										
30										
31										
Aver.										
Total										

TABLE 3

ENGINEERING DEPT.
NEKOOSA-EDWARDS PAPER CO. — PRODUCTION-STEAM-ELECTRIC-POWER — Fig 2b

MONTH SEPTEMBER — MILL J.F. PAPER

Date	PRODUCTION TIME LOST 1	2	3	4	TOTAL	Time Lost Mill-Hrs.	STEAM 1000 LBS. Process	Heating	Total	Lbs. Steam Per Lbs. Prod.	Lbs. Steam Per Lbs. Prod. Mill-Hrs.	ELECTRIC POWER K. W. H. Total	K. W. H. Per Lbs. Prod.	K. W. H. Per Lbs. Prod. Mill-Hrs.
1	14.34 10.75	21.87 1.50			48.46 12.25	5.75	372			4.90	4.23	7990	95	86
2	29.06 1.00	29.54 1.00			30.54 2.00	8.50	345			3.34	4.07	8998	77	89
3												550		
4	24.72 2.25	29.80 2.00			54.52 4.25	3.80	450			4.10	3.74	8780	81	124
5	27.69 5.00	27.67 1.75			49.34 6.75	2.75	410			4.15	4.39	8540	86	135
6	24.67 1.00	27.10 2.25			53.71 3.25	3.50	338			3.19	4.31	8440	81	149
7	23.54 1.25	29.13 .75			52.27 2.00	3.50	418			3.98	4.32	8910	85	136
8	24.14 .50	26.18 1.00			49.31 1.50	1.50	396			4.00	3.75	9200	93	129
9	22.93 1.23	23.43 4.75			45.96 6.00	7.75	366			4.00	4.84	8410	92	152
10												360		
11	24.83 .54	29.21 .25			53.45 .75	1.75	423			3.80	4.95	9330	84	156
12	24.89 .75	28.23 .75			52.12 1.50	2.00	425			3.84	4.52	9100	83	135
13	27.37 1.50	28.98 1.25			56.34 2.75	1.75	420			3.73	5.09	9870	87	158
14	28.12 1.25	29.94 2.25			54.06 3.50	3.50	386			3.57	4.51	8263	77	152
15	26.61 2.50	26.92 1.25			50.69 3.75	2.75	451			4.26	4.07	8860	84	122
16	23.83 2.00	26.34 1.75			50.17 4.25	2.75	470			4.70	4.08	8470	85	126
17												460		
18	26.00 1.00	26.58 1.75			52.58 2.75	.75	465			4.60	3.85	9150	87	125
19	31.98 1.00	28.68 1.00			60.61 2.00	4.25	514			4.50	3.86	8820	73	114
20	27.39 1.25	26.97 3.86			54.36 5.25	1.00	414			4.82	3.50	8120	85	97
21	28.39 .75	27.31 1.00			55.69 1.75	1.50	460			4.14	3.79	8890	80	113
22	31.75 6.23	24.97 1.75			58.83 4.00	.75	555			4.74	3.74	7620	65	105
23	31.15 1.75	27.76 1.00			62.91 2.75	4.75	465			4.75	4.23	8720	89	112
24												380		
25	27.86 1.00	27.41 1.00			55.77 2.00	1.50	419	17	436	3.91	3.45	8840	79	104
26	27.89 1.50	27.76 4.50			56.34 6.00	4.75	392	6	398	4.00	4.07	9280	92	144
27	25.82 3.00	25.82 3.00			49.34 6.00	.75	387	7	394	4.08	3.83	8600	89	135
28	23.62 1.25	25.14 1.00			24.26 2.25	2.00	424	6	430	3.98	3.87	8740	81	143
29	28.92 1.75	24.49 1.50			53.41 3.25	3.00	955			4.28	3.81	8600	81	126
30	26.60 1.50	27.50 1.00			54.10 2.50	4.50	454			4.22	4.19	9010	83	141
1														
Aver.	25.50 2.02	27.28 1.85			52.70 3.87	3.13	429					7650		
Total	662.94 52.50	707.92 48.00			1370.38 100.50	89.25	11149	36	11185	4.08	4.10	224860	84	128

TABLE 4

From Forest to Counter

—*the Story of a Paper Bag*

SO often a business has behind the scenes a story that is really as full of romance and interest as a novel. The facts that make up such "business romances" are, we like to think, the things that make this business of ours different from every other business.

A paper bag is an ordinary looking thing at a casual glance, but behind it lie the resources of a mighty industry, the daily thought and effort of thousands of men and women.

"From Forest to Counter" might be the title of the series of mailing pieces which Union Bag & Paper Corporation has prepared—to show the work and the materials that finally go to make up the humble, every-day paper bag. This series will be an educational and fascinating presentation of the coarse paper and paper bag industry.

Every unit is of immediate interest to all paper jobbers who sell store-supplies to the retail trade. All such jobbers will want to make sure that those of their people who have any real connection with the sale of our products see this campaign from the very first printed unit. It is a real sales training course in paper bags.

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continually make his rounds through the mills regulating the heat, as the responsibility is definitely fixed on this man. If heat adjustment is needed, this man is available through the auto-call system. Storm windows and storm doors should be used more freely in cold climates.

Chart 3 shows pounds of steam per pound of paper in one mill. The concerted effort to reduce steam for heating and process is very noticeable in the winter of 1922 and 1923 and shows the

STOP LEAKS

SIZE OF OPENING	AIR		STEAM		WATER	
	NO. OF CU.FT. WASTED PER MO. 100 LB. PRESSURE	TOTAL COST OF WASTE PER MONTH @.06¢ PER M CU.FT.	NO. OF POUNDS WASTED PER MO. 100 LB PRESSURE	TOTAL COST OF WASTE PER MONTH @.06¢ PER M LB.	NO. OF GALLONS WASTED PER MO. 40 LB. PRESSURE	TOTAL COST OF WASTE PER MONTH @.06¢ PER M GALS.
1/8"	9,979,200	$997 92	460,000	$276.00	692,400	$108.00
1/4"	4,449,600	444.96	203,000	121 80	307,700	48.00
3/8"	1,114,560	111 46	50,500	30.30	76,900	12 00
1/2"	278,640	27 86	12,750	7.65	19,200	3.00
3/4"	68,552	6.96	3,175	1.91	4,800	0.80

AIR STEAM & WATER COST MONEY
DONT WASTE THEM
SHOVEL LESS COAL

value of plotting data of this kind and following it up with heat inspectors who have definite authority and definite responsibility.

Process Steam

Figure 1 shows typical paper mill and sulphite mill steam charts. Fortunate is the boiler room that serves a paper mill only or where the paper mill is a large percentage of the load.

We believe that daily records posted in the mill stimulate production and economy and use the following method. We are fortunate in having two similar paper and pulp mills at Port Edwards and Nekoosa and check one against the other.

Table 4 shows a typical production-power summary sheet for one month. This is posted in each mill and filled in daily. This shows production and steam used for the above heating and process work. Also pounds of steam per pound of production and the same item for the competitive mill.

This chart also shows the kilowatt hours per thousand pounds of product and the same figure for the competitive mill.

It is surprising to note how closely these figres run when they are being watched and compared, as improvements in method or equipment are quickly copied.

Chart 3 shows the monthly paper mill curves that are posted near the daily figures. These show month by month over a period of years the production, the pounds of steam per pound of production and the electric power per thousand pounds of production.

Chart 4 shows similar curves for the sulphite mill.

We cannot leave this subject without a word on leaks. Figure 2 shows what leaks cost. Leaks are usually to atmosphere or through valves. The former are readily noticed and are usually attended to. The latter are many times more important and are often neglected. We many times find a steam hose or a trap discharge buried in water to hide a leaky valve. The best extra heavy valve with renewable disc and seat is none too good for steam, no matter how low the pressure.

In conclusion may we emphasize:

(1) Steam and electric power are large items in conversion cost.

(2) Standardization of comparative data into fixed terms, such as pounds of steam per pound of product, instead of dollars per ton to get permanent comparison.

(3) Use daily and monthly graphic methods.

(4) Measure and burn hog fuel efficiently.

(5) Weed out duplicate steam lines, and cover those left. Cut down on wash basins, water barrels, flat iron heaters, etc. with their long runs of small uncovered steam lines.

(6) Watch heat waste. Use exhaust engines or machine hoods in place of live steam.

(7) Pray for the time when the sulphite digester will use steam STEADILY.

(8) Watch valve leaks—Use high grade extra heavy valves.

(9) Join the News Print Bureau boiler room service.

Report of Heat, Light, and Power Committee

By H. S. Taylor, Chairman

Your Committee's activities for the past year have not been extensive. The tentative program for the Fall Meeting held in Detroit was arranged early in the year but it was later decided that this Committee would not actively interest itself in the Fall Meeting but would, in as far as possible, co-operate with the Waste Committee.

Such a policy was carried out, the members of the Heat, Light and Power Committee entering into such discussions as were brought up at this Committee's meeting.

During the last day of the Detroit convention your Committee held a meeting and a program was arranged to be given at a sectional meeting being held during the Spring convention in New York. This program consisted of three papers, but at this writing but two papers have been presented, entitled "Heat Transference in the Ventilation of Machine Rooms," by J. O. Ross, and "Records of Steam and Electricity in a Paper Mill," by E. P. Gleason.

The past year has shown a steady progression to more normal activity in our industry, but while volume of production is steadily increasing, costs are increasing also and the margin of profit is such that it behooves manufacturers to pay the strictest attention to each little economy in power plant and mill in general, for under present conditions such economies may mean the difference between profit and loss. The transference of heat as exhausted from machine rooms is a subject that has been given much attention lately, for the actual loss in heat units through the exhaust system of the average machine is a goodly percentage of the coal pile, and while the appearance of a cloud of vapor about the machine room roof does not perturb the operator, the actual disappearance of the coal pile is of vital importance, and I have asked Mr. Ross to tell you how this heat can be transferred to the incoming air and thus save a corresponding amount that would otherwise be duplicated from the coal pile.

In passing my office of Chairman of the Heat, Light and Power Committee on to my successor, I wish to thank the members of our Association for their support during the years that I have held office, and I wish also to thank, especially, our President, George E. Williamson, and Secretary, W. G. MacNaughton, for their assistance whenever and wherever such a need arose.

The possibilities of this Heat, Light and Power Committee as an aid to the manufacturer are unquestionable, but more time must be given to the Committee's work than can be supplied by the average member. The real work of this Committee is yet to be done and I sincerely trust the Heat, Light and Power Committee of 1923-1924 will show how much more can be done than has so far been attempted, and I wish them every success for the years, or years, to come.

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Evaporation of Spent Liquor in the Soda and Sulphate Pulp Processes

By G. K. Spence*

Until recent years a large majority of Soda and Sulphate Pulp Mills in this country have used Yaryan evaporators to concentrate spent liquor from the wash pans or diffusers. Yaryans have answered their purpose well and when given the proper attention, are as economical as regards steam consumption as any other evaporator on the market. For mills of small production in which one or two Yaryans have sufficient capacity to handle all of the liquor required and concentrate it to 36° to 38° Bé. at 60° F., there is no reason whatever for making a change. In this case the man in charge of the room has plenty of time to give the machines and pumps proper attention and obtain very efficient results.

The tendency in recent years has been to increase the pulp production to such an extent that four and even five Yaryans are not sufficient to handle all of the spent liquor. Five Yaryans means at least fifteen and generally twenty pumps to take care of, in addition to all minor details such as the examination for leaks around the different effects, etc. The result has been that the Yaryans and pumps have not received the proper attention and therefore, the efficiency of the machines has fallen down. It has been this condition that has caused pulp manufacturers to look around for evaporators with larger units.

It is not the object of this paper to try to influence any pulp manufacturer to purchase any particular type of evaporator, but simply to give the members the benefit of the writer's experience with evaporators, whose actual operating experience has been confined to Yaryans with which all of the New York & Pennsylvania Co.'s soda pulp mills are equipped at the present time. Owing to conditions stated above, installations of evaporators with larger units in some of the mills have been considered, and as a result other types of evaporators have been studied to some extent.

At the present time, ten different makes of multiple effect vacuum evaporators are offered to the pulp manufacturer for his use. They are: The Yaryan, Scott, Zaremba, Swenson, Newhall, Kestner, Lillie, Badger, Buffalo Foundry & Machine Company and Manistee Iron Works evaporators. It is not necessary to give a detailed discription of these different evaporators as any person interested can obtain this information by writing to the manufacturers for catalogues and blue prints.

Yaryan Evaporation

The Yaryan evaporators are of the rapid circulation horizontal tubular type, the tubes being in coils of three or five each. The last tube of each coil discharges into the separating chamber where the liquor strikes a baffle and drops while the steam from the liquor carries over into the shell of the next effect. The liquor from the first effect passes to the tubes of the second effect the heating of which is accomplished by the steam from the liquor of the first effect. This same operation takes place from the second to the third effect of a triple and from the third to the fourth effect of a quadruple effect evaporator. The steam in passing from one effect to the other first passes through a catch-all designed to catch any entrained liquor and convey it to the liquor line entering the next effect. Yaryans are in use in a large number of soda and sulphate pulp mills at the present time.

Scott Evaporators

The Scott evaporator is of the vertical tube circulation type. In place of having one central down-take, the down-takes are distributed over the whole area of the heating surface so that each nest of tubes is taken care of by its own circulating tube. This gives a very rapid circulation and prevents, to a large extent, incrusting of solids in the tubes. In this machine as in the Yaryan, the liquor passes through the tubes and the steam on the outside. The vapor chamber over the heating surface is of sufficient size to minimize entrainment of liquor in the vapors when passing from one effect to the other. As in the case of Yaryans, the Scott evaporators are equipped with catch-alls to take care of any entrained liquor. They can be furnished in any size and at present are in use in soda and sulphate pulp mills in this and foreign countries.

Zaremba Evaporators

The Zaremba evaporator is of the horizontal tubular type; but unlike the Yaryan and Scott, the steam passes through the tubes and the liquor is on the outside. They are built in multiple effect and of any size desired. The vapor chamber over the heating surface is of sufficient size to minimize entrainment of liquor in the vapors passing from one effect to another.

This evaporator is equipped with an internal Hughes centrifugal separator which is fitted at the top of the vapor chamber. The escaping vapors pass through the long spiral passage-way of the centrifugal separator which throws the entrained liquor or foam to the outer edge of the spiral passage-way. This is a special perforated plate having a number of small fins, which catch and retain the liquor particles and in the case of foam, reduces it to a liquor by breaking up the foam bubbles. The liquid trickles down the perforated wall of the separator and flows through a sealed drain under its centre and is returned to the evaporator. This is considered a very efficient form of separator. Zaremba evaporators are installed in a number of pulp mills in this country and giving very good results.

Swenson Evaporators

Swenson evaporators like the Zaremba evaporators are of the horizontal tubular type with the steam passing through the tubes and the liquor on the outside. There is a vapor chamber over the heating surface to minimize the entrainment of liquor in the vapors and catch-alls on the outside after each effect to take care of any entrained liquor. Swensen evaporators are built in any size desired and are at present in use in a number of pulp mills. I understand that the Swenson Company has arranged to take care of the present Yaryan installations and use their engineering ability to improve future Yaryan installations. Their chief engineer states that they will be in a position to manufacture Yaryans of as large units as desired, and at the same time maintain the same efficiency.

Other Types of Evaporators

The Newhall evaporator like the Zaremba and Swenson is of the submerged tube type.

The Kestner evaporators are of the vertical tube type; but while the general run of the vertical tube evaporators have tubes from 7 feet to 12 feet in length, the Kestner evaporator has 23 feet tubes. Like other vertical tube evaporators there is a vapor chamber over the heating surface. It is of the rapil circulation type the liquor passing through the tubes and the steam in the chamber on the outside of the tubes. There are catch-alls through which the vapor passes in going from one effect to another to take care of any entrained liquor. There are Kestner evaporators working on sulphite

*Memb. TAPPI. New York and Pennsylvania Co., Johnsonburg, Pa.

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waste liquor in this and foreign countries; but there are not many installations in this country working on spent liquor from soda and sulphate pulp mills.

The Lillie evaporator like the Yaryan and Kestner is of the rapid circulation film type.

The Badger Company has recently developed a vertical tube rapid circulation type of evaporator with tubes about the same length as the Kestner tubes. This is a new equipment and has not been in use long enough to gather sufficient data to make any definite statements regarding its operation efficiency, etc.

The Buffalo Foundry and Machine Company is manufacturing at present two types of evaporators for use in soda and sulphate pulp mills. One is a horizontal tube and the other a vertical tube type. They recommend the vertical tube rapid circulation type operated as triple or quadruple. The vapor and liquor boil up through vertical tubes from 10 feet to 12 feet long and deflect downward through an annular baffle ring. The liquor returns to the bottom of the steam chest while the vapor passes through a large vapor space to the vapor outlet. Entrainment of liquor in the vapor is prevented by the change of direction and reduction of vapor velocity as soon as it leaves the baffle ring.

From an examination of cuts and blueprints of this evaporator, it appears to be very simple to operate, and one which should produce efficient results.

The evaporator offered by the Manistee Iron Works is of the vertical tube type, in which the liquor circulates through the tubes and the steam on the outside. There is a shaft down through the centre of the evaporator which operates a propeller at the bottom of the heating surface which assists in circulation of the liquor. These evaporators are built in very large units, there being one operating at Ritman, Ohio, on salt liquor which has 22 feet diameter effects.

All of the above mentioned evaporators are made in double, triple or quadruple effects and require condensers, vacuum, feed and tail pumps.

Multiple Effect Evaporators

Multiple effect evaporators can be operated advantageously on exhaust steam from condensing engines; but in the present day of steam, turbines and motor drives, almost all evaporator installations are supplied with live steam. This steam pressure varies from 15 to 20 pounds and the vacuum on the last effect from 24 inches to 27 inches.

All multiple effect evaporators have their talking points and while some may be better than others for special purposes, when all is said, any good standard evaporator, should with proper attention produce efficient results. However, they should be in units large enough so that two of them will take care of all of the liquor from the wash pans.

When operating a multiple effect evaporator the pulp manufacturer very often loses sight of the prime factor which is absolutely necessary to make his evaporator efficient. This prime factor is vacuum and it is essential that every attention should be paid to keeping the vacuum as high as possible on the last effect in order to procure the proper working results. There has been a tendency, at times, to condemn evaporators without giving them the proper chance to show what they can really do.

I know of one case where the vacuum on the third effect of a triple was not over 20 in. and the machine was condemned because it was not producing efficient results. One can readily see how inefficient will be an evaporator working under a 20 in. vacuum in place of 27 in.

Causes for Inability to Maintain Vacuum

The principal causes for inability to maintain the requisite vacuum are leaks around the different effects, high temperature condenser water, and inefficient vacuum pump. Leaks in the vacuum end of the machine can be readily detected by use of a torch. There is a tendency at time to use too much water in the jet condensers when the water is too warm for efficient results. This will flood the vacuum pump so much with water that its only office will be that of pumping water and will not have the proper pull on the last effect of the machine. This condition can be remedied by using cataract condensers which consume a comparatively small quantity of condensing water and will not flood the pump but allow it to pull a large amount of air in addition to the water and maintain the vacuum on the machine.

Multiple effect evaporators are built with the intention that they operate on a high vacuum principle and when working under proper conditions, a double should evaporate 1.8 pounds of water; a triple 2.7 pounds of water and a quadruple 3.6 pounds of water per pound of steam consumed. In other words for the evaporation of each 1,000 gallons of liquor per hour, a double effect evaporator will consume 4,630 pounds of steam; a triple 3,080 pound of steam, and a quadruple 2,310 pound of steam.

The cooling water necessary for a triple effect, evaporating above amount of water per hour would be 175 gallons per minute of 70° F water and 235 gallons per minute of 80° F water; while that necessary for a quadruple evaporator would be 130 gallons per minute of 70° F water and 175 gallons per minute of 80° F water.

There is no other way in which to better demonstrate the advantage of maintaining a high vacuum than by giving results obtained in the Yaryan rooms of four soda pulp mills, when making an analysis of the different departments.

Results in Evaporator Rooms

In figuring the heating surface of a multiple effect evaporator, the heating surface of one body is always taken whether it be a double, triple, or quadruple machine; and where the surfaces differ in the different effects, the total in all effects is taken and divided by the number of effects to get the average heating surface for each effect. The following is the result of analyses of the evaporator rooms of the different mills.

Mill No. 1—2 triple effect yaryans	1-11 coil—5 tubes to the coil 1-12 coil—5 tubes to the coil
Average steam pressure on first effect	25 lb.
Temperature of weak liquor	160° F.
Altitude of the mill	125 ft.
Highest possible vacuum	29.86 in.
Boiling point of water	211.75° F.
Average vacuum	27 in.
Boiling point of water at this vacuum	112° F.
Average strength of weak liquor	10° Bé. at 60° F.
Average strength of strong liquor from the evap	38° Bé. at 60° F.
Boiling point of strong liquor at yaryans	130.5° F.
Total 48% soda used at digesters in 24 hours	68,975 lb.
Loss at wash pans 1% or 690	1% or 690 lb.
Soda sent to yaryans	68,267 lb.
48% soda per gallon of 10° liquor	3.668 lb.
Weak liquor sent to the yaryans	102,200 gal.
48% soda per gallon of 38° liquor	3.67 lb.
Strong liquor from yaryans	18,602 gal.
Water evaporated in 24 hours	83,598 gal.
Water evaporated in 24 hours	696,371 lb.
Water evaporated per sq. ft. of heating surface	698 lb.
Water evaporated per hr. per sq. ft. of heating surface	3.49 gal.
Mill No. 2—1 quadruple effect yaryan	24 coils—3 tubes per coil
2 triple effect yaryans	22 coils—5 tubes per coil
1 triple effect yaryan	15 coils—5 tubes per coil
Average steam pressure	25 ft.
Temperature of liquor entering first effect	165° F.
Altitude of mill	575 ft.
Highest possible vacuum	29.22 in.
Boiling point of water	210.5° F.
Average vacuum	24½ in.
Boiling point of water at this vacuum	136° F.
Average strength of weak liquor	9° Bé. at 60° F.
Average strength of strong liquor	34° Bé. at 60° F.
Boiling point of strong liquor at this vacuum	156.68° F.
Total 48% soda used at digesters in 24 hours	153,174 lb.
Loss at wash pans	1½% or 2,298 lb.
Soda sent to yaryans	150,876 lb.
48% soda per gal. of 9° Be. liquor	.6 lb.
Weak liquor sent to yaryans	251,461 gal.
48% soda per gal. of strong liquor	3,175 lb.
Strong liquor from yaryans	47,526 gal.
Water evaporated in 24 hours	203,934 gal.
Water evaporated in 24 hours	1,698,770 lb.
Water evaporated per sq. ft. of heating surface	484 lb.
Water evaporated per hr. per sq. ft. heating surface	2.42 gal.

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Mill No. 3—3 triple effect yaryans.....11 coil—5 tubes per coil

Average steam pressure on first effect	25 lb.
Temperature of liquid entering first effect	165° F.
Altitude of mill	1,441 ft.
Highest possible vacuum	28.4 in.
Boiling point of water	209.2° F.
Average vacuum	23 in.
Boiling point of water at this vacuum	142° F.
Average strength of weak liquor	9½° Bé. at 60° F.
Average strength of strong liquor	39° Bé. at 60° F.
Boiling point of strong liquor at this vacuum	159.9° F.
48% soda used at digesters in 24 hours	64,624 lb.
Loss at wash pans	1½% or 969.6 lb.
Soda sent to yaryans	63,654 lb.
48% soda per gal. of 9½° Bé. liquor	.63 lb.
Weak liquor sent to yaryans	101,039 gal.
48% soda per gal. of strong liquor	3,799 lb.
Strong liquor from yaryans	16,756 gal.
Water evaporated in 24 hours	84,283 gal.
Water evaporated in 24 hours	702,077 lb.
Water evaporated per sq. ft. heating surface	474 lb.
Water evaporated per hr. per sq. ft. heating surface	2.37 gal.

Mill No. 4—1 quadruple effect yaryan.....24 coils—3 tubes per coil
2 triple effect yaryans.....15 coils—5 tubes per coil
2 triple effect yaryans.....22 coils—5 tubes per coil

Steam pressure on first effect	25-30 lb.
Altitude of mill	1,441 ft.
Temperature of liquor entering first effect	158° F.
Boiling point of water	209.2° F.
Highest possible vacuum	28.4 in.
Average vacuum	23 in.
Boiling point of water at this vacuum	142° F.
Average strength of weak liquor	9¼° Bé. at 60° F.
Average strength of strong liquor	39½° Bé. at 60° F.
Boiling point of strong liquor at 23 in. vacuum	160.1° F.
48% soda used at digesters in 24 hours	165,824 lb.
Loss at wash pans	2% or 3,316 lb.
Soda sent to yaryans	162,508 lb.
48% soda per gallon of weak liquor	.63 lb.
Weak liquor sent to yaryans	257,950 gal.
48% soda per gallon of strong liquor	3,865 lb.
Strong liquor from yaryans	42,046 gal.
Water evaporated in 24 hours	215,904 gal.
Water evaporated in 24 hours	1,798,480 lb.
Water evaporated in 24 hrs. per sq. ft. of heating surface	450 lb.
Water evaporated per hr. per sq. ft. of heating surface	2.25 gal.

When the above analyses were made, the Yaryan room of mill No. 1 was operating under ideal conditions. While the difference in efficiency of this department over the same department in the other three mills was not entirely due to increased vacuum, this increase will account for from 60 per cent to 75 per cent of the difference.

Steam at 25 lb. pressure will have a temperature of 266° F. The excess boiling point of liquor over water in each effect is assumed to be respectively 3° F; 8° F and 18° F or a total of 29° F. Therefore, the net temperature range at 23 in. vacuum is (266°—142°)—29° = 95°. If the vacuum is increased to 27 in. the net temperature range would be (266°—112°)—29° = 125°.

The water evaporated would be in direct proportion to the temperature ranges. Therefore, the capacity of the machine would be increased about 32 per cent by increasing the vacuum from 23 in. to 27 in., and maintaining the same steam pressure. If the machines evaporated 2.37 gal. per hr. per sq. ft. of heating surface at a 23 in. vacuum, they should evaporate 3.12 gal. per hr. per sq. ft. of heating at a 27 in. vacuum. Since Mill No. 1 showed an increase of 1.12 gal. per hr. over No. 3 it can be seen that 0.75 gal. or 66 per cent of the difference was due to increased vacuum. The Yaryans of mill No. 1 were given proper attention and as a result were in condition to evaporate the maximum amount of water in the allotted time.

It is of considerable assistance to evaporators to have the weak liquor pre-heated before entering the first effect and this is done in a number of installations.

As a matter of control it is advisable to have a venturi-meter installed to measure the weak liquor sent to the evaporator. This can be arranged so that the amount of liquor going to all or each individual evaporator can be measured when so desired and this is a very good check on the working of the machine.

Some years ago the writer compiled a table which has been very helpful in determining the quantity of liquor handled by the Yaryans in the different mills and it may prove of assistance to others desiring to check their machines.

Spent Liquor Table

11,000	gal. of	1°	Bé. liquor	will make	7,800	gal. of	1¼°	Bé. liquor at	60° F.
7,800	"	1¼°	Bé.	" "	4,600	"	1⅝°	Bé. "	60° F.
4,600	"	1⅝°	Bé.	" "	3,000	"	2⅛°	Bé. "	60° F.
3,000	"	2⅛°	Bé.	" "	2,200	"	2¾°	Bé. "	60° F.
2,200	"	2¾°	Bé.	" "	1,800	"	3⅛°	Bé. "	60° F.
1,800	"	3⅛°	Bé.	" "	1,400	"	3⅞°	Bé. "	60° F.
1,400	"	3⅞°	Bé.	" "	1,200	"	4½°	Bé. "	60° F.
1,200	"	4½°	Bé.	" "	1,000	"	5⅛°	Bé. "	60° F.
1,000	"	5⅛°	Bé.	" "	800	"	6⅛°	Bé. "	60° F.
800	"	6¼°	Bé.	" "	700	"	6⅞°	Bé. "	60° F.
700	"	6⅞°	Bé.	" "	600	"	7⅞°	Bé. "	60° F.
600	"	7⅞°	Bé.	" "	550	"	8½°	Bé. "	60° F.
550	"	8½°	Bé.	" "	500	"	9⅜°	Bé. "	60° F.
500	"	9⅜°	Bé.	" "	450	"	10⅜°	Bé. "	60° F.
450	"	10⅜°	Bé.	" "	400	"	11½°	Bé. "	60° F.
400	"	11½°	Bé.	" "	350	"	12¾°	Bé. "	60° F.
350	"	12¾°	Bé.	" "	325	"	13½°	Bé. "	60° F.
325	"	13½°	Bé.	" "	300	"	14½°	Bé. "	60° F.
300	"	14½°	Bé.	" "	275	"	15⅝°	Bé. "	60° F.
275	"	15⅝°	Bé.	" "	250	"	17°	Bé. "	60° F.
250	"	17°	Bé.	" "	225	"	18½°	Bé. "	60° F.
225	"	18½°	Bé.	" "	200	"	20¼°	Bé. "	60° F.
200	"	20¼°	Bé.	" "	175	"	22¼°	Bé. "	60° F.
175	"	22¼°	Bé.	" "	150	"	25°	Bé. "	60° F.
150	"	25°	Bé.	" "	125	"	28½°	Bé. "	60° F.
125	"	28°	Bé.	" "	118	"	30°	Bé. "	60° F.
118	"	30°	Bé.	" "	103	"	33°	Bé. "	60° F.
103	"	33°	Bé.	" "	100	"	33⅓°	Bé. "	60° F.
100	"	33⅓°	Bé.	" "	97.7	"	34°	Bé. "	60° F.
97.7	"	34°	Bé.	" "	94.2	"	35°	Bé. "	60° F.
94.2	"	35°	Bé.	" "	90.8	"	36°	Bé. "	60° F.
90.8	"	36°	Bé.	" "	87.6	"	37°	Bé. "	60° F.
87.6	"	37°	Bé.	" "	84.5	"	38°	Bé. "	60° F.
84.5	"	38°	Bé.	" "	81.6	"	39°	Bé. "	60° F.
81.6	"	39°	Bé.	" "	78.8	"	40°	Bé. "	60° F.

100 gallons of 33⅓° liquor contains 310 pounds of 48 per cent soda or 256.6 pounds of 58 per cent soda. One gallon of 1° liquor contains 0.45 oz. of 48 per cent soda.

Loss of Soda at Wash Pans

Under a control system the loss of soda at the wash pans is known, and deducting this amount from total soda used in the digesters gives the pounds of soda sent to the evaporators. Knowing the average strength of this liquor, from the above table the pounds of soda per gallon can be found. Dividing this into the number of pounds of soda sent to the evaporators gives the gallons of weak liquor sent to the evaporators.

In the same way the gallons of strong liquor from the evaporators can be determined and the difference between gallons of weak liquor and gallons of strong liquor gives the gallons of water evaporated. Example—A mill used 150,000 pounds of 48 per cent soda in 24 hours and lost 1 per cent or 1,500 pounds at the wash pans. Therefore, 148,500 pounds of soda were sent to the evaporators.

Weak Liquor

The average test of the weak liquor was 9⅜ Be. at 60° F. Referring to the table 500 gallons of 3⅜° liquor contains as much soda as 100 gallons of 33⅓° liquor or 310 pounds. Therefore, one gallon of 9⅜° Be. liquor contains .62 pounds of 48 per cent soda.

The average test of the weak liquor was 9⅜° Be. at 60° F. Re-Referring to the table 90.8 gallons of 36° liquor contains as much soda as 100 gallons of 33⅓° Be. liquor or 310 pounds. Therefore, one gallon of 36° liquor contains 3.414 pounds of 48 per cent soda.

Since 148,500 pounds of 48 per cent soda were sent to the evaporators and it contained .62 pounds per gallon, 239,516 gal. of liquor were sent to the evaporators. As a general rule, there is practically no loss of soda at the evaporators. Therefore, 148,500 pounds of soda were sent from them to the rotary tank, and since this liquor contains 3.414 pounds of soda per gallon, 43,497 gallons of strong liquor were sent to the rotaries. Since the evaporators received 239,516 gallons of liquor and delivered 43,497 gallons, they will have evaporated 196,019 gallons of water.

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Abstracts and Bibliography

By C. J. West, Chairman

The Chairman regrets to report that the work of the Committee on Abstracts and Bibliography has been materially slowed up during the past year because of the pressure of his regular duties.

The work planned for the year consisted for the most part of a systematic indexing of the paper magazines, as it is felt that this is the only logical basis for a complete bibliography on any phase of the subject. Very little progress has been made, however, for reason mentioned above. It is hoped that some advance may be made during the coming year.

One constructive piece of work consists in the revision of the "Location list" of paper periodicals, originally compiled by F. C. Clark. Sixty-seven libraries and individuals supplied information for this revision, which was published in the PAPER TRADE JOURNAL for January 25, 1923. A copy may be had upon request.

Another publication of the committee is the revised list of the publications of the Bureau of Standards. Brief abstracts of most of the articles are included in this bibliography.

A bibliography on the "Beating of Paper" has been prepared as an appendix to the chapter on Beating for the text books. This will be extended later and published as a contribution from the committee.

During the past year thirteen requests were received for bibliographies on various subjects. Some of these could be answered by reference to published information, while the others required special search. Ten requests were received for loan of magazines or for photostat copies of material, and many other requests were received for miscellaneous information; in part these were received from the Secretary's office, Bureau of Standards, and the Research Information Service of the National Research Council. This phase of the Committee's work is one of the most encouraging.

The Chairman, in co-operation with Dr. G. J. Esselen, Jr., Chairman of the Cellulose Division, American Chemical Society, has prepared a translation of Emil Heuser's "Text book of Cellulose Chemistry," which will appear during the summer from the press of the McGraw-Hill Book Company, Inc.

An important change in the Committee's activities occurred January 1, 1923, when the work of the Committee on Abstracts was combined with that of the Committee on Bibliography. It is too early to say how the change will work out, but it is hoped that it will be to the satisfaction of the Association.

Contributions of the Committee

For reference purposes a complete list of the contributions of the Committee is appended:

No. 1.

United States government publications pertaining to pulp and paper. Henry E. Surface.

Paper, 19, No. 4, 25-30 (Oct. 4, 1920).

This is a second edition, revised and enlarged, of "A list of United States public documents pertaining to pulp and paper," by Henry E. Surface, *Journal of Industrial and Engineering Chemistry, 5,* No. 7, 614-616 (July, 1913).

No. 2.

Handmade paper and its watermarks: A bibliography. Dard Hunter.

Paper 20, No. 12, 20-26 (May 30, 1917).

No. 3.

American and foreign paper trade periodicals: A list of subscribers maintaining permanent files. Frederick C. Clark.

Paper, 21, No. 4, 90, 92, 94, 96, 98, 100 (Oct. 3, 1917).

No. 4.

Bibliographic standards. Recommended for the Technical Association of the Pulp and Paper Industry. Henry E. Surface.

Paper, 21, No. 22, 150, 152, 154 (Feb. 13, 1918).

No. 5.

Government paper bibliography: United States government publications pertaining to pulp and paper—Supplement No. 1. Helen E. Stockbridge.

Paper, 22, No. 11, 38, 40 (May 22, 1918).

This is supplementary to the Association committee's contribution No. 1, by Henry E. Surface.

Paper Deterioration

No. 6.

Bibliography of paper deterioration. H. M. Lydenburg.

Paper, 22, No. 19, 12-13 (July 17, 1918).

No. 7.

Literature of the paper industry. A bibliography adapted from Akesson-Everling-Fluckiger. M. Hubbard.

Paper, 21, No. 23, 54, 56, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80 (Feb. 12, 1919).

No. 8.

Forest products statistics. Adapted from a compilation by U. S. Central Bureau of Planning and Statistics. Appendix: Bibliographies of official publications, by M. Hubbard.

Paper, 23, No. 26, 11-14 (Mar. 5, 1919); *24,* No. 1, 15-17, 38 (Mar. 12, 1919).

Paper Research

No. 9.

Paper research literature, (I). A list of contributions by members of the U. S. Forest Service, Forest Products Laboratory: 1910-1918. With appendix of contributions by other members of the service; 1877-1918. Etta L. Matthews. Appendix by Helen E. Stockbridge.

Paper, 24, No. 8, 259-264 (April 30, 1919).

No. 10.

Paper research literature, (II). A list of contributions by members of the Forest Products Laboratories of Canada: 1913-1918. With appendix of contributions by other members of the Canadian Forestry branch. Eva M. Smith.

Paper, 24, No. 9, 15-16 (May 7, 1919).

No. 11.

Paper research literature, (III). A list of contributions by members of the U. S. Bureau of Chemistry; 1904-1918, Edward O. Reed.

Paper, 24, No. 13, 15-16 (June 4, 1919).

No. 12.

Paper research literature, (IV). A list of contributions by members of the laboratory of Arthur D. Little, Inc., Boston, Mass., 1889-1918.

Paper, 24, No. 17, 24-26 (July 2, 1919).

No. 13.

British patent office library accession. A select bibliography of cellulose, paper and allied subjects. M. Hubbard.

Paper 25, No. 4, 32, 34, 36, 38, 40, 41, 44, 46, 48, 50, 52 (Oct. 1, 1919); No. 9, 15-19 (Nov. 5, 1919); No. 10, 25 (Nov. 12, 1919).

No. 14.

Paper research literature, (V). A list of the contributions by the staff of L'Ecole Francaise de Papeterie (French School of Papermaking, at the University of Grenoble), compiled by Prof. Barbillion.

Paper, 25, No. 23, 20-22 (Feb. 11, 1920).

No. 15.

L. C. card references for paper men. A descriptive book bibliog-

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raphy of the arts, technology and economics of paper. Compiled with extensive emendations from the Library of Congress printed index cards. M. Hubbard.

Paper, 26, No. 7, 150, 152-158, 160, 164, 168, 173, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 196, 198, 200, 202, 204, 206, 208, 210; No. 8, 11-15, 25-28 (April 21, 28, 1920).

Filter Paper

No. 16.

Filter paper: a reading list. Clarence Jay West.

Paper Trade Journal, 71, No. 15, 34, 36, 38, 40 (Oct. 7, 1920).

No. 17.

Paper research literature (VI). A list of the contributions by the staff of the Königlichen Materialprüfungsamt zu Berlin-Lichterfelde West (Royal Testing Institute of Berlin). Originally compiled by William Herzberg. Translated and augmented by Clarence Jay West.

Paper Trade Journal, 71, No. 17, 48, 50, 52, 54, 56, 58; No. 18, 52, 54, 56, 58, 60, 62, 64, 66, 68 (Oct. 21, 28, 1920).

No. 18.

Paper research literature, (VII). A list of the contributions by members of the Bureau of Standards, Department of Commerce, 1910-1920. F. A. Curtis.

Paper Trade Journal, 71, No. 19, 48, 50 (Nov. 4, 1920).

No. 19.

The sizing of paper: a reading list. Clarence Jay West.

Paper Trade Journal, 71, No. 20, 50, 52, 54, 56; No. 21, 110, 112, 114, 116 (Nov. 11, 18, 1920).

No. 20.

History of papermaking in the United States. Maude V. Dickinson.

Paper Trade Journal, 71, No. 21, 176, 178, 180, 182, 184, 186 (Nov. 18, 1920).

Blotting Paper

No. 21.

Blotting paper: a reading list. Clarence Jay West.

Paper Trade Journal, 71, No. 22, 48, 50, 52 (Nov. 25, 1920).

No. 22.

The bleaching of paper. Clarence Jay West.

Paper Trade Journal, 71, No. 24, 36, 38, 40, 42, 48 (Dec. 9, 1920).

Papermaking Materials

No. 23.

Papermaking materials. Clarence Jay West[2].

Paper Trade Journal, 71, No. 25, 44, 46, 48, 50, 52, 54, 62; No. 26, 54, 56, 58, 60, 62; *72,* No. 1, 30, 32, 34, 36, 38 (Dec. 16, 23, 30, 1920); No. 2, 46, 48, 50, 52, 54; No. 3, 30, 32, 34, 36, 38, 40; No. 4, 34, 36, 38, 40, 42, 44; No. 5, 60, 62, 64, 66, 68; No. 6, 58, 60, 62, 64, 66, 68; No. 7, 64, 66, 68, 70, 72; No. 8, 48, 52, 54, 56, 58, 60; No. 9, 54, 56, 58, 60, 62; No. 10, 48, 50, 52, 54, 56 (Jan. 6-Mar. 3, 1921).

No. 24.

Bibliographie de la Papeterie (A bibliography of papermaking). Charles Dumercy. Translated by Dard Hunter.

Paper Trade Journal, 72, No. 11, 56, 58, 60, 62, 64, 66; No. 12, 54, 56, 58, 60, 62. (Mar. 10, 17, 1921.)

No. 25.

Paper manufacture: a bibliography H. H. B. Meyer.

Paper Trade Journal, 72, No. 13, 56, 58, 60, 62, 64, 66; No. 14, 50, 52, 54, 56, 58; No. 15, 48, 50, 52, 54, 56, 58, 60. (Mar. 24, 31, Apr. 7, 1921.)

No. 26.

Recent literature on the determination of cellulose. Compiled by Hottenroth; translated by Clarence J. West.

Paper Trade Journal, 72, No. 17, 50-54 (Apr. 21, 1921).

Marbled Paper

No. 27.

A bibliography of marbled paper. Dard Hunter.

Paper Trade Journal, 72, No. 18, 52ff. (April 28, 1821).

No. 28.

Reciprocity and the tariff in the paper industry. Clarence J. West.

Paper Trade Journal, 72, No. 19, 48ff. (May 5, 1921).

Paper Dyeing

No. 29.

The dyeing of pulp and paper. Clarence J. West.

Paper Trade Journal, 72, No. 20, 46ff. (May 12, 1921).

No. 30.

Reading list on paper yarns and textiles. Clarence J. West.

Paper Trade Journal, 72, No. 22, 42ff. (May 26, 1921).

Clay

No. 31.

Clay in the Paper Industry. A reading list compiled by Clarence J. West.

Paper Trade Journal, 72, No. 23, 52ff. (June 2, 1921).

Cigarette Paper

No. 32.

Special Papers, III. Cigarette paper, a reading list. Clarence J. West.

Paper Trade Journal, 72, No. 25, 44ff. (June 16, 1921).

No. 33.

Paper research literature, VIII. The work of C. F. Cross. Arranged by Clarence J. West from *World's Paper Trade Rev.* 75, No. 4, 338 (Jan. 28, 1921).

Paper Trade Journal, 73, No. 3, 46ff. (July 21, 1921).

Sulphate Paper

No. 34.

Sulphate pulp and kraft paper. List of references covering the literature up to 1912. Clinton K. Textor.

Paper Trade Journal, 73, No. 4, 46ff.; No. 6, 46ff.; No. 7, 54ff. (July 28, Aug. 11-18, 1921).

No. 35.

Recent literature on soda and sulphate pulps. Clarence J. West.

Paper Trade Journal, 73, No. 16, 46ff.; No. 17, 42ff. (October 20-27, 1921).

No. 36.

Bibliography of papermaking for 1921.

Paper Trade Journal, 74, No. 16, 51-54; No. 17, 53-56; No. 18, 60-62, 64; No. 19, 60, 62, 64; No. 20, 51-53, 57 (April 20-May 18, 1922). Tech. Asso. Papers V, No. 1, 96-114 (1922).

Periodicals

No. 37.

American and Foreign Paper Trade Periodicals. Frederick C. Clark and Clarence J. West.

Paper Trade Journal, 76, No. 4, 45-49 (Jan. 25, 1923).

A revision of Contribution No. 3.

No. 38.

Paper research literature, VII. Revised.

A list of contributions by members of the Bureau of Standards, Department of Commerce, 1910 to Dec. 31, 1922. F. A. Curtis and C. J. West.

A revision of Contribution No. 18.

Paper Trade Journal, 76, No. 6, 47-52 (Feb. 8, 1923).

Electricity

No. 39.

Electricity in Pulp and Paper Mills. A reading list. Clarence J. West.

Paper Trade Journal, 76, No. 8, 50-53 (Feb. 22, 1923).

No. 40.

Bibliography of Papermaking for 1922. Clarence J. West and A. Papineau-Couture.

Paper Trade Journal, 76, No. —, — (— —, 1923).

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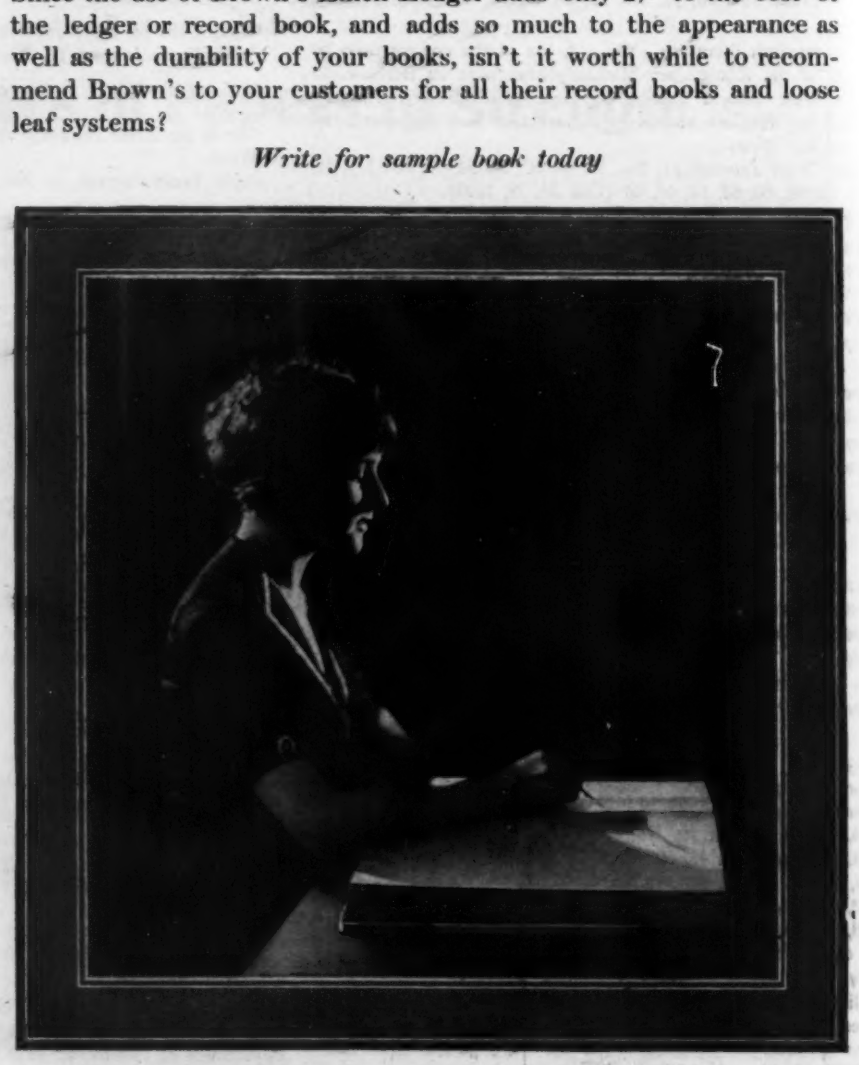

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Report of the Committee on Cellulose

By W. E. Byron Baker, Chairman

The report of the committee on sulphite pulp as submitted to the association last year at the annual meeting, expressed a suggestion that the formation of a committee on cellulose would be very desirable because of the fact that such a committee would be the logical one to deal with such problems of cellulose constitution, properties, and the factors in the preparation which govern to an extent these properties, and the adaptability of the various commercial cellulose and pulps to conversion into the various grades of paper and other allied manufactured products. It seemed clear that the subject matter of the work of such a committee would not fall within the scope of the activity of the committee on sulphite pulp, nor of either the committee on soda pulp, or the committee on sulphate pulp and it was further evident that much of the work of the cellulose committee would be of equal interest to those engaged in the manufacture of either of the three above mentioned commercial pulps.

Committee Appointed

For the above reasons, about two months following the last annual meeting, a committee on cellulose was appointed, and some plans for getting some work under way were considered. It was soon evident, however, from the nature of the work involved and the nature of the subject, that the only effective way to start was by holding a symposium on cellulose at the earliest opportunity in connection with a meeting of the Technical Association. While there was some hope of arranging some such meeting in connection with the autumn convention held last year in Detroit, plans along this line did not materialize, and the matter was held over for this annual meeting.

Symposium

The symposium which will be held at this meeting will have several objects. Several papers on subjects related to cellulose will be presented and discussed, as listed on the program. These promise to prove very interesting, and it is hoped that this part of the symposium alone will warrant a good attendance. Another phase of the symposium work will be the discussion of and the eventual agreement upon the exact amount and nature of work to be dealt with in the coming year. It is hoped that the interest of the chemists in the leading pulp mill laboratories may be enlisted and that these chemists in their respective laboratories will find it agreeable to co-operate in the coming year with the committee in the testing of certain methods of examination and analysis of pulps, particularly in respect to their content of the various types of cellulose and associated bodies, and lignin remaining as a residue, with the purpose in mind of eventually adopting certain procedures and methods as standards. Every pulp and paper chemist will readily recognize that this does not constitute a small task, particularly if he considers that in 1920, when the German Pulp and Paper Chemists took up the problem of cellulose determination, no less than 29 distinct procedures were investigated. Incidentally, the report of this work and the other work of the members of the "Faserstoff-Analysenkommission," found in Volume 13, of the publications of the German Pulp and Paper Chemists, merits our conscientious attention as an association of chemists as well as a committee.

Colloid Chemistry

The consideration of cellulose from the point of view of the colloid chemist will also receive some attention at the symposium. One of the members of the committee, Dr. Jessie E. Minor, will discuss this phase of the subject matter, and will correlate some of the results of her work along these lines with the results of various other well known investigators. It is because of the fact that in the papermaking art cellulose comes into play as a complex colloid, as contrasted to a simple chemical individual, in the form of the various types of commercial pulps, that this aspect of the subject should prove of interest. It is the colloid properties of cellulose which make it valuable in the manufacture of paper.

Recently several inquiries have been received and some interest has been shown in the use of certain analytical methods as applied to pulps. Among these may be mentioned the determination of alpha, beta, and gamma cellulose present, the determination of residual lignin, the determination of bleaching characteristics of pulp, the conduct of the pulp toward oxidizing agents as a means of evaluation for certain uses, and as a means for process control in pulp manufacture, means of determining the beating characteristics, the microscopy of pulp fibers, etc.

Constitution of Lignin

The question of the constitution of lignin also falls within the scope of the activities of the committee, because of the close relationship and association of lignin and cellulose in the wood, and the resulting importance of an at least partial knowledge of this subject in the proper preparation of the most satisfactory pulp for any given purpose. It is quite certain that when the constitution of lignin is better understood, that the reactions which take place in the cooking of pulp by the various processes will also be better understood, with the result that the technical control in the industry will be made more effective and will be more simplified. Better products will be made in a more profitable manner.

Recent Literature

Certain literature on the subject of cellulose has been examined, and will be considered and discussed in a general way at the symposium. It is really regrettable that the English literature on the subject is not more copious. Cross and Bevan's "Cellulose" and "Researches on Cellulose" still seem to be the most comprehensive sources, although there is no doubt that a considerable amount of literature will soon result from the work of the Cellulose Section of the American Chemical Society. The papers already published by Dr. Hibbert and others are quite noteworthy. The leading foreign literature is in German and Swedish. The most comprehensive work is Schwalbe's "Die Chemie der Cellulose." Other closely related books are "Schwalbe-Sieber—Die chemische Betriebskontrolle in der Zellstoff und Papier Industrie," and the volume 13 of the German Pulp and Paper Chemists Association, referred to above. The publications by Prof. Dr. Klason, some of which have appeared in English translation, and others of which will soon appear, are very valuable, particularly on the subject of lignin. Very valuable in the study of cellulose is the quite recent and modern publication by Dr. Emil Heuser entitled "Lehrbuch der Cellulosechemie." The recent work of Schmidt and Graumann on cellulose determination by chlorine dioxide is worthy of mention and discussion, because it is claimed to overcome many of the difficulties and drawbacks of the previous methods, and because it is also claimed to open up a new approach to the problem of the constitution of lignin.

Greater Interest Hoped For

It is hoped that the proper amount of interest will be manifested in the subject of cellulose and the work of the cellulose committee, and that the committee may have the hearty co-operation of the chemists in the mills in the coming year.

The Committee on Cellulose, R. H. McKee, George Barsky, R. N. Miller, Jessie E. Minor, W. E. Byron Baker, Chairman.

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Bleaching Pulp at High Consistency

By R. A. Hayward*

When work was started on rebuilding the sulphite mill at Newton Falls, N. Y., in order to make a high grade of bleached sulphite it was decided to install equipment for bleaching the pulp at as high a consistency as possible. This decision was arrived at because from previous experience it was found that less bleach and less steam were required to bleach at high densities and the quantity of dirt in the finished product would be also considerably less.

Up to this time most of the mills were bleaching between 5 and 6 per cent consistency with only one installation operating at consistencies between 10 and 12 per cent. From the results obtained in this equipment it was known that it was impossible to go higher without excessive power and maintenance costs. After pulp reaches a density of about 14 per cent it begins to follow the laws and properties that govern solids instead of liquids. It was also recognized that in the bleaching operation only enough agitation is required to positively insure a uniform mixing of the bleach and stock. With these ideas in mind R. B. Wolf designed the bleachers that are now in operation at Newton Falls. The bleacher consists of a rectangular concrete tank with tile lining and with a partition running through the center of the long way of the tank. There are two large cast iron worms in the bottom of each side and two cross worms in each end so that the stock is carried from one end of the bleacher to the other and is transferred from one side to the other by means of the cross worm which runs approximately 40 revolutions per minute. The longitudinal worms run about 4 revolutions per minute.

In order to insure the uniform mixing of the stock with the bleach and to make it possible to add bleach at one point and be sure that it would mix uniformly with all the stock in the bleacher the end flight of each longitudinal worm was reversed. This had the effect of holding approximately one-half ton of stock in each end of the bleacher and caused it to continually turn back upon itself. As the stock is carried down the bleacher it merges into the mass and an average sample is carried across into the other compartment by means of the cross worm.

After the bleacher was in operation, extensive power tests were made on it and it was found that only 50 horse power was required to operate it. These bleachers hold 5 tons of stock and it requires about three hours to bleach the stock after all of it is in the bleacher. This makes the power requirements per ton of pulp very low. Due to the fact that the worms run slowly and the thrust on the worms is absorbed by ball bearing thrust bearings the maintenance is practically nothing.

After the bleacher had been operated for a short time it was found that the best results were obtained when the bleaching temperature did not exceed 85° F. It was also found that there was some 10-15° F. temperature rise in the bleaching due to the heat of the reaction so that only in the most severe weather in the winter time was any steam required to maintain the temperature and this was only a very small amount because of the high consistency and low temperature required.

It was also found that there was over 25 per cent saving in the quantity of bleach required when operating at 20 per cent consistency instead of 6 per cent. This makes it possible to either save bleach and obtain the average strength or it makes it possible to cook an inferior grade of wood and obtain a high strength with a relatively low per cent of bleach.

At Newton Falls there was a great deal of poor hemlock wood as well as some wood that had lain in the pile as long as 10 years. This was all put through the wood room without any particular care in cleaning and a clean grade of pulp was made from it. At this consistency all of the organic dirt seems to bleach out provided it is fine enough to bleach in the same time required by the stock. Some of the wood that was cooked was so poor in quality that it would not float in the pond and it was necessary to wheel it into the wood room in wheel barrows. Due to the fact that it was possible to make a clean quality of pulp from this wood, it was possible to use up all of this inferior wood that had been left during the last few years of operation on unbleached pulp.

After the pulp is bleached in the bleacher there is a certain amount of inorganic dirt present, part of it coming with the unbleached stock, and part of it coming with the bleach liquor. In order to remove this dirt a bleach riffler was installed, which in this case was 15 feet wide and 60 feet long. The stock flows onto this riffler at approximately 0.3 of 1 per cent consistency. As it flows over the riffler all of the heavy dirt settles to the bottom and collects on the felt. It is necessary to wash the riffler with high pressure water once a day. A great deal of care also has to be taken to see that the water used in washing the bleached pulp is entirely free from dirt as any dirt coming into the system from this source will stay in the product.

Extensive shrinkage tests were made on the bleaching system, accurately weighing all of the unbleached pulp as it was put into the bleacher and then again weighing the pulp after it was taken off from the wet machines. Three of these tests were made and in each 15 to 20 tons of stock was used so that the results would be reliable.

The overall shrinkage on hemlock pulp was 5.3 per cent and the overall shrinkage on spruce 4.04 per cent, the chemical shrinkage being 4.37 per cent in the case of hemlock and 3.11 in the case of spruce.

Drainers were used for washing the stock so that the stock loss from this source was very low. It of course is true that the amount of shrinkage is dependent to quite an extent on the nature of unbleached stock. In all of these tests we used what would be classed as a hard bleaching stock so that you would normally expect a high shrinkage. It is hard to make direct comparisons of shrinkage tests due to the great variation in plant conditions and equipment. From previous shrinkage tests made on stock that was bleached at the thinner consistencies one would have expected a shrinkage of about 10 per cent.

Tests were made on the equipment with both soda and sulphate stock. The results of these tests showed both a low shrinkage and low bleach consumption as compared with the results obtained when bleaching the same stock at 4 to 5 per cent consistency. In the case of the soda stock only 5 per cent of bleach was required to reach the same shade which was obtained with 10 per cent at the lower consistency.

Due to the fact that the stock is at a high consistency and also because of the fact that it bleaches very rapidly, only a small amount of floor space is required as compared with other systems. Experimental work is now being carried on to establish accurately the relationship between bleach consumption and consistency.

The bleach system does not require any more attention than other types that are in operation. At Newton Falls one man looks after the filling, dumping, and washing of the stock so that the labor costs per ton are very low.

Our experience with these bleachers only confirms previous theories and experiences in other plants, in that a cleaner pulp can be produced with less bleach at lower temperatures when bleaching at high densities.

* Member TAPPI. Assistant Professor of Chemical Engineering, University of Michigan, Ann Arbor, Mich.

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The Study of Papermaking Materials

By A. B. Green*

It is now many years since the great engineering societies first realized the importance of knowing exactly the properties of the materials of construction. Not only safety demanded it, but the very economy of design that is the engineer's particular business rested on knowledge of the scientific kind regarding the substances out of which buildings and machinery can be wrought. At the very foundation of all engineering calculation and design, therefore lies such work as has been done by the American Society for Testing Materials.

A Need Pointed To

Since the beginning of our Technical Association, thanks to the able and energetic work of many members, there has been very marked progress in the development of tests for paper, and the succeeding editions of "Paper Testing Methods" afford ever broadening and better standadized tests by which to judge the values in paper. But there is a difference, nevertheless, and the difference points to a need. The difference is that we have been developing ways of measuring our *finished product*, whereas the engineers have built a science around their *raw materials*. And the need is for us to know how to express the paper making characteristics of our own raw materials quantitatively and accurately, if we mean to develop the paper maker's art to its highest.

Measuring the Value of Fibers

At the Annual Convention seven years ago it was the writer's privilege to lay before the Association a brief report of progress up to that time in certain efforts of his own to measure the values of fibers, or pulps, independently, from the paper making standpoint. That short paper contained about the same appeal as is being brought before you now, in these sentences:

"There will be a tremendous saving in clearness, if those who undertake any of the problems of beating will compare notes sufficiently to make their *methods* accord with each other, and to adopt the same *units of measurement*. This need not involve the disclosure of any facts which may have become trade secrets, yet it would help toward a common language. It would help also in speed. Each plant approaching the study of beating for its own purposes ought to be enabled to base its work upon the methods already developed elsewhere for that study, and whenever it may have evolved a new or better method it ought to contribute that to the general chest. It is for the good of every plant that the work of each plant, so far as methods are concerned, should be a step in advance and not a rediscovery of ways and means already developed."

The italics were not in the original draft, but seven years and hardly another discussion of the subject would seem to suggest that they should have been.

That former paper alluded to methods of studying the characteristics of paper stuff as means for analyzing the action of the beater on the stock. The methods were first developed for that purpose. They were necessary to the problem, for in no other way could one hope to get accurate expression of the differences made in stuff by different beater treatments without becoming involved in the variables—known but unmeasured—unknown but suspected—in the running of the stuff out over the paper machine. But the methods themselves have a far wider range of usefulness.

Study of Jordan Filling

For example, a new type of filling had been put into a jordan refining engine. Fig. 1 represents a part of the study of this jordan filling. Each curve of this chart traces out a separate property of the stock which passed through the jordan, and shows what effect was produced upon the stock with respect to that property at different rates of consumption of power in the engine.

Perhaps the most striking thing about the chart is the agreement among the various curves as to amounts of power applied to the jordan result in the greatest changes in paper making characteristics in the stock. All the curves are similar in that they show comparatively little change, comparatively gentle slope in other words, between the point of no power and the point of 107

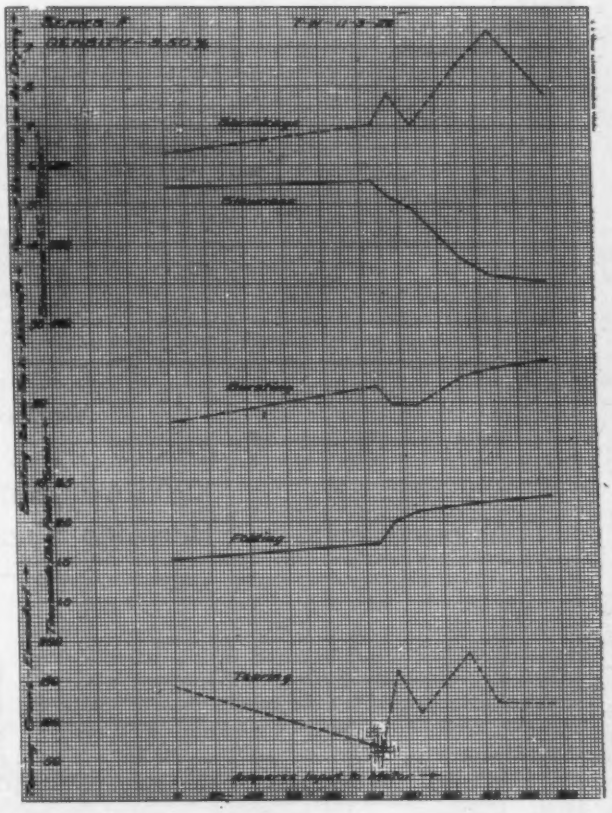

FIG. 1.

amperes input to jordan motor. They also agree in showing comparatively brisk activity, comparatively steep slopes, between 107 amperes and 160 amperes. It is safe to say that this fact could be demonstrated in no other way quite so clearly as by means of an analysis of the various paper making qualities separately, as it was carried out in this instance.

Secondly, hardly less striking, and certainly less to be expected, is the radical disagreement among the various curves in direction. Almost any prediction based on general mill experience would have been that while the jordan engine produced the effect of slowing the stock, and increasing its tendency to shrink in the process of drying, it would also correspondingly increase the bursting strength. On the contrary, however, as the measurements show under conditions of the test, the period of the most radical changes in slowness of the stock is marked by a reduction in bursting strength followed by a recovery, the net result of which is very

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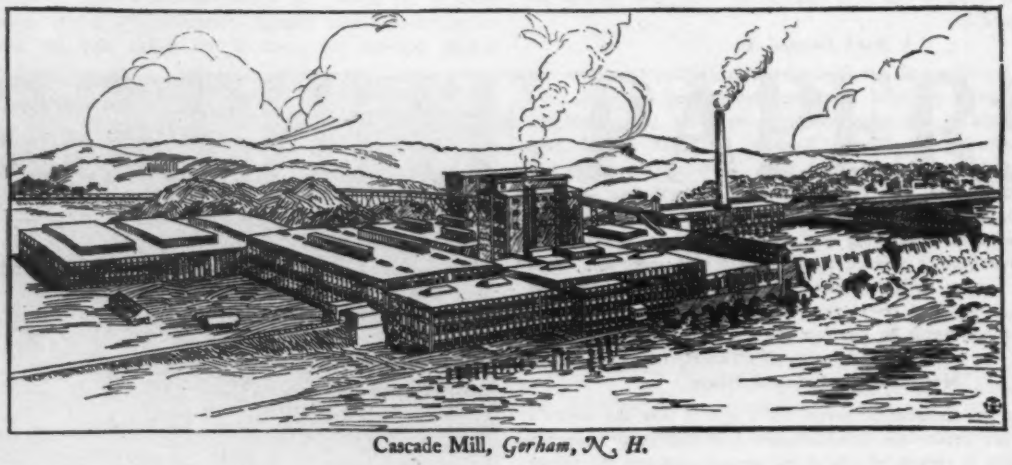

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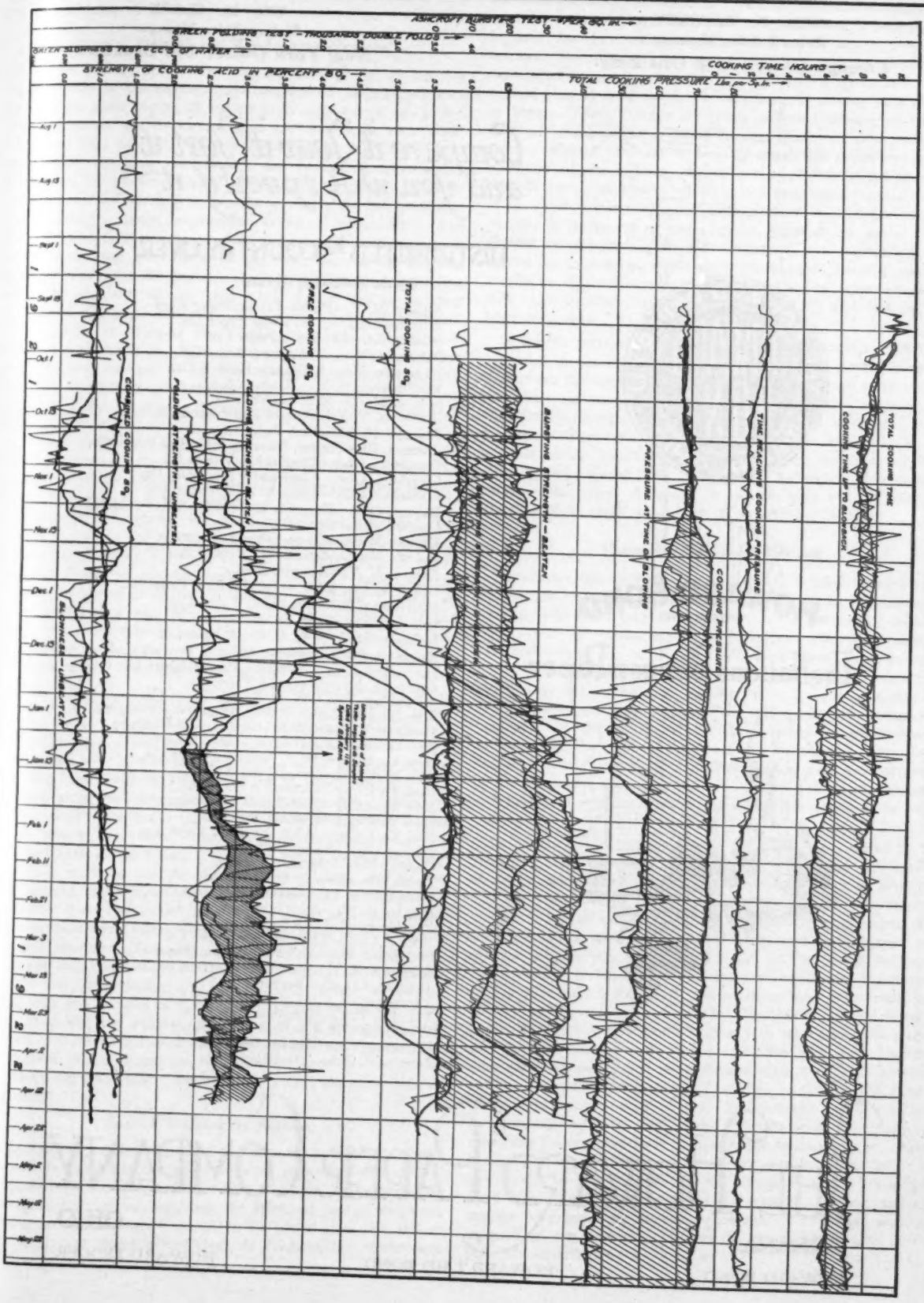
ASHCROFT BURSTING TEST—LBS. PER SQ. IN.
BRIGHTNESS TEST—PER CENT
COOKING TIME HOURS
STRENGTH OF COOKING ACID IN PERCENT SO2
TOTAL COOKING PRESSURE Lbs. per Sq. In.
TOTAL COOKING TIME
TIME REACHING COOKING PRESSURE
COOKING TIME UP TO BLOWBACK
COOKING PRESSURE
PRESSURE AT TIME OF BLOWING
BURSTING STRENGTH—BEATEN
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little improvement in bursting strength in return for roughly fifty per cent addition of power.

Bursting Strength and Developing Endurance

It is interesting also to compare the development of bursting strength with the corresponding development of folding endurance through the same range of variation in expenditure of power. The two curves are in form almost the reverse of each other. They both tend upward, but they could be revolved about axes having about the same upward slope and the folding curve upside down from its present position would look very much like the bursting curve. Both tend to become horizontal at the upper end, that is, above a power expenditure of about 160 amperes. The first 107 amperes of powder produce about 13 per cent increase in folding endurance and about 22 per cent increase in bursting strength. The next 20 amperes result in an increase in folding endurance of about 22 per cent more, but a loss in bursting strength of nearly 15 per cent. The next 25 amperes additional power results in bringing the bursting strength back to only slightly more than it had been at 45 amperes less, so that, as regards bursting strength 45 amperes have been practically wasted. The same increase in power expenditure has brought the folding endurance of the stock to a slightly higher point than it had been at 25 amperes less.

It is not exact, of course, to speak of power as measured in amperes, but since the voltage was constant the variations of power were proportional to amperage, and the proportional changes are the vital factors in this comparison.

Turning to the tearing strength of the stock, the first 107 amperes applied to the jordan reduced the tearing strength about 50 per cent. In other words, as regards tearing strength, it would have been better to use the jordan not at all. Additional expenditure of power produced an increase in tearing strength up to the point of about 152 amperes, but at no point was the tearing strength distinctly above its value before the jordan had been applied to the stock at all, and certainly there is no point in the curve that would give promise of an increase in tearing strength anywhere nearly in proportion to the expenditure of power. As a final result, after the application of all the power that the motor would safely carry, the tearing strength was actually less than it was before the jordan treatment.

These tests were carried out on a furnish of all bleached sulphite which had been beaten in a hollander and to which the color, size, clay, and alum, had been added. The samples from which the determinations were made that establish the first points on the various curves were taken from the jordan headbox before the stock had entered the refiner. The first setting of the plug was made at a point where the first hum was heard, and at this point samples were taken at the discharge end of the refiner, before the stock had passed to the chest. At each plug setting where samples were taken, power readings were noted from the indicating ammeter. The plug was set successively harder until the motor had been loaded to its limit of safety. Stock passing through was at a density of 3.50 per cent. Since it required only a very few minutes to make each determination of the power input, to collect the samples, and to write the notes, the entire test was performed in less than fifteen minutes, and there was no interruption to mill operations and no effect upon the running of the sheet on the paper machine in these short periods of observation.

Law of Diminishing Returns

It is not the present purpose to announce what conclusions were drawn from this particular piece of work regarding the value of the special type of jordan filling that was tested, or to generalize from these observations regarding the effect of jordan treatment, its value to the making of the paper, its power efficiency, and so on. The curves shown in this chart do illustrate that under each set of given conditions there is a definite limit above which it is wasteful to expend more power at the jordan, and it may further be said that by making such an analysis as this a close and accurate determination can be made of the law of diminishing returns as applied to the refining engine in a given mill. The present purpose is to stress the importance of making such studies as these. Different types of filling, different designs of engine, different arrangements of drive, different grades of stock, different speeds, different densities, in fact, all imaginable differences in the operation of the refining engine, can be definitely evaluated as regards their comparative effect on the papermaking qualifications of the stock; consequently it is unnecessary to reach decisions as to changes in equipment or operation by judgment, or guess, in the absence of definite information. Moreover, the engineering data needed for approaching these problems in an engineering way can usually be obtained without upsetting the regular operation of the mill, and obtained nevertheless on the mill, and not on the laboratory, scale.

If, for the purposes of a given problem, more qualities need to be measured, it can be done; for the standard pulp sheets which are made from the samples of the stock can be subjected to practically every test that can be applied to paper itself after manufacture. Thus in the present instance, the sheets could have been tested for sizing effect, bulk, tensile strength, stretch, and formation, in addition to the qualities shown on the chart, and each of these other qualities would have been depicted by means of a separate curve on the chart. As much, or as little, data may be collected, as required to reach an answer to the problem in hand.

Changes in Methods of Cooking

On another line of work, the task was undertaken to express in definite units of measurement what were the effects on unbleached sulphite pulp of various changes made in the methods of cooking, these units of measurements to relate to the paper making qualifications of the pulp. The tests were made on every cook blown between September 1, 1921, and April 15, 1922. Significant changes in the methods of cooking were brought into play by W. S. Haley, who took charge of the mill during this period, and applied to it the results of his own study and experience in sulphite mills the country over, covering many years. Mr. Haley has come nearer to complete scientific control over the operations of the sulphite mill than anyone else of the writer's acquaintance, and nearer than anyone has yet mastered the operations of paper making.

Each cook during the period of the tests was sampled at the thickener after screening. Each sample was tested for density. Based on this density determination, tests were made of slowness, and the remainder of the sample was put through two separate courses. Out of one part a set of standard pulp sheets was made containing stock exactly as sampled after the thickener, and another portion was put through a run in the pebble mill at a predetermined density, for a predetermined number of revolutions, at a predetermined speed, and the resulting stock was made into another set of standard pulp sheets. In addition to the slowness of the stock before pebble-mill beating, tests were made of bursting and folding qualities both before and after pebble-mill beating. The results were plotted as ærdinates against days of abscisso, and on the same chart, shown herewith, certain of the factors of the cooking were also plotted. The strength of cooking acid in percentage of SO_2 total, free, and combined, the length of time from the commencement of steaming to the reaching of cooking pressure, the length of time at cooking pressure, the length of time from the commencement of the blow-back to the commencement of the blow, the amount of the cooking pressure, and the amount of pressure at the commencement of the blow, were all recorded on the same time scale as the results of the tests on the pulp just described.

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There were, one the average, during this period about five cooks each twenty-four hours. The factors of each cook that have been enumerated were separately determined and plotted, making an average of five points on each curve each day. The straight-line curves were struck from the daily averages of the five determinations, thus arriving at one point on each curve for each day, representing the average for that day. In order better to show the tendency of each curve, a running ten-day average was struck, whereby each daily point of the curves of averages, shown heavy on the chart, is itself the average for that day and the nine days immediately preceding. Each space on the accompanying chart represent ten days, Sundays included.

All of the work necessary for this study was performed by one man in about two-thirds of the day. The tests require accuracy, care, regularity, and a capacity for sustained interest. These qualifications are possessed in high degree by F. T. Marden, who is responsible for the data given on the accompanying chart.

Folding Strength, Beaten and Unbeaten

Before examining the curves in detail, attention is invited to the two curves of folding strength, beaten and unbeaten. Up to January 11, 1922, the folding tester was operated by hand. Beginning on that day the folding tester was thereafter operated by constant speed motor drive, at 82 r. p. m. During the period of hand operation as much care as possible was exercised to obtain constant speed, but it was not possible to regulate or gage the speed except by judgment, and separate determinations showed that there were wide fluctuations in the speed of the tester. During that period there appears to be no significance to the rise and fall of the curve of folding strength. It is a very manifest example of the importance of having a constant speed mechanical drive for the folding tests.

What the Chart Shows

Referring to the chart, from September 1 to November 1, there occurred the rise in strength of cooking acid which is characteristic of the advent of cool water in mills where the problem of cooling with river water has not been thoroughly studied out. Coincident with this increase in strength of cooking of cooking acid there was a corresponding shortening in the total time of cooking, and in the time consumed in reaching cooking pressure. As temperature conditions improved with later autumn weather, the cooking pressure was allowed to increase. The mill was recovering from summer handicaps and resuming what was then considered capacity production. Aside from some change in slowness of unbeaten stock, toward slowness, these changes were not reflected in any change in paper making qualifications. Bursting strength before and after beating remained about constant.

Changes in the methods of cooking began to be put in force November 1, 1921. Their full operation depended, of course, on getting certain changes made in piping, in certain of the fittings of the digester, in the cooling system for both raw acid and relief, and accordingly consumed some time. Their full operation commenced about December 15, 1921.

From November 1 to December 15 some attempt was made to blow back prior to blowing down, and on the chart it will be noted that the curve representing cooking time up to blowback tends to separate from the curve showing total cooking time, and correspondingly the curve of cooking pressure and the curve of pressure at time of blowing tend to separate, both during this period. The unbeaten stock became slightly freer, but there was no change in the bursting strength before or after pebble-mill beating.

After December 15, however, there was a radical shortening of time at cooking pressure without any lengthening of total cooking time, and correspondingly a radical reduction of pressure at time of blowing without any comparable increase in cooking pressure. Accompanying these changes there was a sharp increase in strength of cooking acid. The radical rise of the curve of total SO_2 is followed by a similar rise in the curve of free SO_2, leaving the curve of combined SO_2 substantially constant.

From December 15 on, there is a progressive rise in bursting strength of the pulp after pebble-mill beating, but no change in bursting strength unbeaten. From January 11 on, there is a progressive rise in folding strength both beaten and unbeaten, but that of the beaten continues beyond that of the unbeaten. Accompanying these increases in the strength of the pulp, the curve of slowness before pebble-mill beating gives evidence of a tendency toward freeness, the opposite of what would be expected, and more advantageous for the paper mill.

All of these tendencies in the papermaking qualifications of the stock reach their development about February 1, and are sustained until after the termination of the tests in April. Although the tests unfortunately could not be carried out uninterrupedly through the summer, they had been in accord with paper mill experience with the stock while they were continued, and thereafter the paper mill experience indicated that the improvements shown in the pulp by the tests had been sustained.

It has not been thought generally that the product of the pulp mill could be evaluated with respect to its suitability for making paper of a given character, except by putting it through the paper mill for a long enough period of time to try it on the mill and then on the mill's customers. But it is possible for the pulp mill to know the nature of its product. Whether operated in connection with a paper mill which consumes all of its output, or whether wholly or partially marketing its output, the qualifications of the pulp produced from every cook can be accurately evaluated with respect to its fitness as a papermaking material.

The samples taken for test are run in a centrifugal for moisture determination, tested at known density for slowness, and converted under standardized conditions and in a standard manner into sheets of equal weight, dried uniformly in warm air, and in the form of these sheets tested in as many ways as may be necessary for the purposes of the work. The methods of making the tests are substantially the same no matter what the purpose. The same methods are about to be used to form an engineering judgment as to the value of one of the patented attachments for the hollander beater. The slowness test alone is probably enough for a measured judgment of the character of groundwood pulp, aside from the question of color and cleanliness. Throughout the whole range of problems relating to the characteristics of stock, or of the preparation of stock, or of the beating or refining of stock, the same methods of study apply. It would be well if the pulp and paper industry put more of its effort into defining and measuring the papermaking qualifications of its raw materials, not only to the extent of utilizing the methods of study already at hand, but of adding to them and improving them.

JAPAN NEEDS CIGARETTE PAPER

The total output of the Tobacco Monopoly Bureau who owns and operates all the cigarette and tobacco factories in Japan is 23,000,000,000 cigarettes and 61,333,720 pounds of cut tobacco. This industry, says Trade Commissioner Hallock Butts, in a report to the Department of Commerce, requires the use of very large quantities of paper and boxboard. It is the largest single purchaser and consumer of paper in the country. Purchases are not made direct but through the medium of certain local firms designated by the Monopoly. These firms have the privilege of submitting bids for all supplies, and contract with foreign suppliers. No sales are made direct to the Monopoly. The central organization, however, controls the specifications for the various commodities, and through this control standard specifications are adopted for supplies for the various factories included in the Monopoly. This arrangement together with the large quantities required would seem to make this very desirable business for American paper and board mills, because it gives them long runs on large sizes in satisfactory weights.

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Report of Committee on Mechanical Pulp

By W. A. Munro, Chairman

The Committee on Groundwood attempted during the past year to find out how much influence the different types of burrs used had on the grade of stock produced. To do this we sent a questionnaire to nearly all the groundwood mills in the U. S. A. and Canada, and received much interesting information. This was tabulated by the Committee and will be presented and discussed at the sectional meeting tomorrow.

We also went into the effect of the use of white-water on freeness of stock used in newsprint manufacture, and its action on a paper machine. This paper was supplementary to the work of the Committee on Waste and fully covers the use of re-water and its effect on Groundwood.

We have asked several people interested in the operation and manufacture of different types of grinders to compare the relative cost for labor, overhead, repair and upkeep between these types, and to indicate the definite limits for the magazine grinders as compared with the pocket types.

The manufacture of Groundwood during the past few years has been developed along much more scientific and technical lines than ever before in the history of the industry. This development has been along two fairly distinct lines, one, that of manufacturing more economically from the payroll point of view and the other that of manufacturing efficiently from the point of view of maximum yield and uniformity.

The development from the economic side has resulted in the installation of larger units, or increasing the power to a unit. In older installations three pocket grinders were formerly driven by 300-400 hp., and five and six tons to a stone was considered sufficient production. The tendency lately has been to raise the power per grinder from 450-600 hp., and to install either four pocket grinders or to increase the size of the stone and in this way to increase the production per man-hour.

A considerable number of large new grinder installations are of the magazine type. This type reduces the number of men used to a minimum, and the production per unit is higher with this type than with any other.

During the past year a new type of magazine grinder, the Chainfeed, has been put on the market, that does away with several objectionable features of the older or pocket type of magazine grinder. By means of the constant feed of the chain type, the motor load is practically constant; there is no variation in pressure of grinding, hence a more uniform grade of pulp.

The screen rejections that formerly helped fill up the river are now being given much attention, and different treatments according to the use they are to be put to.

In the manufacture of wrappers for shipping rolls, they go direct to the paper machine without much refining. In the case of Insulite, a board made entirely of Groundwood rejections, some refining is done, especially if a dense board is required.

The refining of screening for re-use as No. 1 Pulp has brought into use two new refining engines, entirely different in design and principle, both giving satisfactory results, and tending toward an absolutely closed system in groundwood manufacture.

The freeness-slowness tester has come into general use in progressive mills and is a valuable way to determine quickly and accurately the nature of the stock. By means of frequent tests the Groundwood can be kept uniform and more satisfactory results obtained especially on high speed machines where variations in stock cause considerable trouble.

The committee feel that an attempt should be made to standardize all freeness testers and the procedure of testing so that when one hundred test stock is referred to, a certain known grade of stock is meant. We feel that this would be of especial value to mills which purchase a large quantity of groundwood yearly, and which now have no control over the manufacture. We would like to suggest that an effort be made in the next year by the Groundwood Committee and the Committee on Standard methods of testing materials, to work out a procedure and standard tester, that at the next meeting the Technical Association may act on it, and recommend it to the industry if it so desires.

A Comparison of Some of the Features of the Film and Submerged Tube Types of Vacuum Evaporators

By Martin L. Griffin*

The Yaryan, Kestner and Lillie are illustrations of the film type, while the Swenson, Newhall and Zaremba represent the submerged tube type. There are designs which embody features of both kinds as for instances those whose heating surface is composed of vertical tubes externally heated and in which the liquor line reaches over a part of the height of the tubes. The Scott evaporator belongs to this class.

Basis of Economy in Vacuum Pans

The basis of economy in operating vacuum pans is composed of two parts:

First—Their adaptation to the use of low pressure exhaust steam from non-condensing engines. Such engines taking steam at 120 lbs. gauge pressure contaning 1,185 B.t.u. total heat, and exhausting against a back pressure of 6 lb. in which the total heat units are 1,134 B.t.u., will consume only about 5 per cent of the heat delivered to it. If therefore there is a use for this exhaust the cost for power becomes very small. There is no better and more constant customer for this than the vacuum evaporator when properly designed to operate with low pressure steam.

Second—The economy of a multiple effect evaporator consists in the application of the latent heat of steam over several stages in a temperature range between that of the initial steam and the boiling point of a liquid under a vacuum of about 26 inches. The total temperature drop is divided into as many parts as there are units in the evaporator and in each stage the temperature of the oncoming vapor must be greater than the maximum boiling point of the liquor to which it is applied, or otherwise there will be no boiling action. It follows therefore that the higher the pressure and temperature of the initial steam, the greater will be the total temperature drop available, and permissible number bodies, which may be four or five; but when exhaust steam is available, it is more economical to carry the work over three stages.

Rapid Heat Transference

Effective evaporation depends upon several factors, chiefly rapid heat transference. The greater the difference in temperature be-

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tween the two sides of the heating surface, the more rapid will be the transfer, therefore a good range of drop is necessary, if capacity is wanted.

In order to make effective this heat transfer provision must be made for the removal of non-condensible gases and the condensate from the steam side, while, on the liquor side rapid circulation is important to sweep the steam bubbles away as they form which also retards the transmission of heat. Experiments on surface condensers have shown that the co-efficient of heat transmission varies with the square root of the velocity.

The vaporizing belt should be so arranged on the liquor side as to provide for easy egress of the escaping bubbles and a separating chamber of adequate size. The boiling temperature depends not only upon the density of the liquor but its depth upon the heating surface or static pressure. Where there is a considerable depth of liquor covering the heating surface, it is quite possible that there may be active boiling near the surface and none at all at the bottom. There is a difference of about 6° F. in the boiling point between the top and the bottom of a body of liquid 4 feet in depth. Since heat transfer by evaporation depends so largely on the change in the state of aggregation from the liquid to the gaseous phase this static head and the distance through which the bubbles of steam must pass to escape from the liquor, its boiling depth is quite important.

Will Cost More for Same Capacity

From this it follows that anything which obstructs a rapid heat transfer or increases the temperature of boiling will necessitate a machine of larger heating surface and cost more for the same capacity.

By the same token an evaporator of the submerged tube type will vary in cycles as the concentration of the liquor increases when operated on the batching plan. If operated on the continual plan, the last body will be working at its maximum boiling temperature all the time, which would reduce its capacity still further.

In this type the problem of distribution of the liquor over the heating surface is negligible; whereas in the film type greater care must be exercised to insure a uniform film over the heating surface. Each has its desirable and undesirable limits.

To illustrate progress in this art of film distribution of liquor the Yaryan machine was orginally fitted with an external distributing manifold of pipe connections to the entering end of each horizontal body. Later this was improved by replacing this arrangement with a distributing chamber. The drawbacks to this arrangement are that while the size of the ports are adjusted to deliver equal quantities of liquor to the same heating surface they gradually get out of balance by wear and so the distribution comes to be unequal. In this case we do not have what we call "circulation" of the liquor but a single passage over the heating surface. If you will turn to the Kestner, Scott or any vertical tube type, distribution over the heating surface is accomplished by a small bottom chamber into which the lower end of the heating tubes dip and circulation is effected by the ebullition of boiling.

Can Be No Standard Practice

From the argument presented it may be seen that a heating surface composed of vertical tubes of ample size so that the velocity of ebullition will not be excessive and with a well devised arrangement for the return passage of the liquor has its advantages in many particulars.

It must be born in mind, however, that there can be no standard practice. Each case must be viewed not only as a special problem in evaporation but in relation to its product and its relation to other features of the plant as a whole.

The subject of evaporation is a very important one and oftentimes a complicated problem in chemical engineering and is well worth a thorough study.

A Quick Test to Determine the Brittleness of Paper

By Paul L. Houston*

I. Introduction

The ordinary test to determine the bursting strength of paper is recognized as a valuable test for paper. However, it does not indicate the condition of brittleness which is important. The following test was devised to give a result which is interpretative of both bursting strength and brittleness.

II. Apparatus Employed

The apparatus employed for this test was a Mullen paper tester and a baby stack of calenders, Fig. 1, consisting of two steel rolls, 9¼ inches long and 2 inches in diameter. The bottom roll of the calender was motor driven and the top roll weighed 7.8 pounds.

III. Test Procedure

Ten grades of paper were chosen from lots of paper which were obtained from the Government Printing Office. Twelve samples were taken from different parts of each grade lot as representative of the lot.

Ten samples out of the twelve were taken and were submitted to the following tests.

1. Creasing and Bursting

For this test, each sheet of paper was creased in the machine, cross and both directions by means of the baby stack of calenders. Both single and double folds were made. The paper was then

TABLE 1.—RESULTS OF BURSTING STRENGTH TESTS ON PAPER WITH AND WITHOUT CREASES

Identification number	Kind of paper	Fibre composition: Rag %	C. P. B. %	C. %	M. & J. %	Without creases points	With crease: Single: Mach. dir., pts.	Single: Cross dir., pts.	Single: Both dir., pts.	Double: Mach. dir., pts.	Double: Cross dir., pts.	Double: Both dir., pts.
52	M. F. Printing....	...	100	...	...	13.1	9.4	6.4	5.2	9.0	6.2	4.3
53	S. & S. C. Print..	...	100	...	...	14.9	12.3	9.0	8.0	9.5	7.3	6.3
54	M. F. Writing....	...	100	...	...	19.8	18.9	15.5	14.1	18.1	12.9	12.3
55	Fine Writing.....	100	...	...	...	54.4	53.1	44.4	43.5	49.3	38.2	37.1
56	Fine Bond.....	100	...	...	...	37.9	36.2	31.8	30.2	35.2	25.7	24.7
57	Bond	100	...	...	...	38.9	36.3	30.4	29.0	34.3	27.7	26.6
58	Ledger	100	...	...	...	85.0	80.7	76.9	74.9	77.7	66.9	64.1
59	Ledger	75	25	...	...	41.6	39.3	34.5	31.9	37.2	28.4	27.4
60	Kraft Wrapping...	...	...	100	...	40.4	39.6	33.2	32.0	36.0	29.7	27.9
61	Rope Manila.....	...	...	25	75	89.5	88.7	76.7	73.7	85.2	66.3	64.5

R = Rag. C.P.B. = Chemical Pulp Bleached. C = Coniferous. M. & J. = Manila and Jute. Mach. = Machine. Dir = Direction. Pts. = Points.

*Associate Physicist, Bureau of Standards. By permission of the Acting Director, Bureau of Standards.

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bursted on the crease by means of the Mullen tester. Where the paper was creased in both directions, the test was made directly on the intersection of the creases. Ten tests were made of each crease direction and of both single and double creases. The paper was also tested for bursting strength without creases in the usual manner. Thus, 70 tests were made on each grade of paper and

TABLE 2—PER CENT DECREASE IN BURSTING STRENGTH OF PAPER DUE TO CREASING

	Single crease			Double crease				
Identification number	Machine directions per cent	Cross directions per cent	Both directions per cent	Machine directions per cent	Cross directions per cent	Both directions per cent	Average of all creases per cent	Grading of papers
52	28.2	51.2	60.3	31.3	52.7	67.2	48.5	10
53	17.4	39.6	46.3	36.2	51.0	57.7	41.4	9
54	4.5	21.7	28.7	8.6	34.8	37.9	22.7	8
55	2.4	18.4	20.0	9.4	29.8	31.8	18.6	4
56	4.5	16.1	20.0	7.1	32.2	34.8	19.1	5
57	6.7	21.8	25.4	11.8	28.8	31.6	21.0	7
58	5.1	9.5	11.9	8.6	21.3	24.6	13.5	1
59	5.5	17.1	23.3	10.6	31.7	34.1	20.4	6
60	2.0	17.8	20.8	10.9	26.5	31.0	18.2	3
61	.9	14.3	17.6	4.8	25.9	28.0	15.2	2

the average results are shown in Table 1, to show the decrease in the strength of each paper due to the creases.

2. FOLDING ENDURANCE

The same papers were tested for folding endurance by means of a Schopper folding machine. The procedure for this test is fully described in Bureau of Standards Circular No. 107. The average results of ten tests are shown in Table 3.

V. Conclusions

In Tables 2 and 3, the papers are graded as to quality according to the results of the various tests. It is interesting to note that the results of the bursting strength test on creased paper and the results of the folding endurance test give the papers the same grading. This fact shows that there is a relationship between the two tests. In Table 3, a grading is made according to the ratio of the bursting strength without creases to the weight of the standard size ream 25 x 40,500 of paper. This is the usual method of comparing papers for strength. This grading, however, differs from the other gradings.

TABLE 3—RESULTS OF FOLDING ENDURANCE TESTS ON PAPER AND THE RATIO OF BURSTING STRENGTH TO WEIGHT OF PAPER (WITHOUT CREASES)

	Folding endurance							
Identification number	Machine direction, double folds	Cross direction, double folds	Average of machine and cross direction, double folds	Grading of paper	Weight, 25x40, 500 pounds	Bursting strength, points	Ratio, bursting strength to weight, per cent	Grading of papers.
52	1.6	1.4	1.5	10	74.0	13.1	17.7	10
53	3.5	3.4	3.4	9	50.4	14.9	29.6	9
54	29.0	7.4	18.2	8	42.8	19.8	46.3	8
55	97.4	116.6	107.0	4	79.0	54.4	68.9	4
56	66.0	71.5	68.7	5	54.1	37.9	70.0	3
57	45.2	44.9	45.0	7	57.2	38.9	68.0	6
58	2,772.3	1,417.5	2,094.0	1	95.0	85.0	89.4	2
59	55.7	75.1	65.4	6	82.0	41.6	50.7	7
60	56.4	191.8	124.1	3	59.2	40.4	68.2	5
61	2,194.5	523.4	1,358.9	2	89.2	89.5	100.2	1

This is to be expected, because a hard-sized brittle paper will always test high on the Mullen tester. As soon as this same paper is creased, however, its strength is decreased considerably and it will test much lower. The folding endurance test has been considered a valuable test to determine the brittleness or wearing quality of paper. This study shows that a bursting strength test of creased paper practically determine the same thing in a different way and can be used to better advantage than the folding endurance test since the bursting strength test has almost become a standard test in the paper trade, and every paper mill, jobbing house, and printer owns a Mullen tester. The conclusion to be drawn from these facts, therefore, is that the bursting strength test of creased paper determines a more reliable value of the strength, brittleness and wearing quality of paper than the ordinary bursting strength test of paper without creases. In the case of the higher grades of paper and those used for permanent records, this is very important.

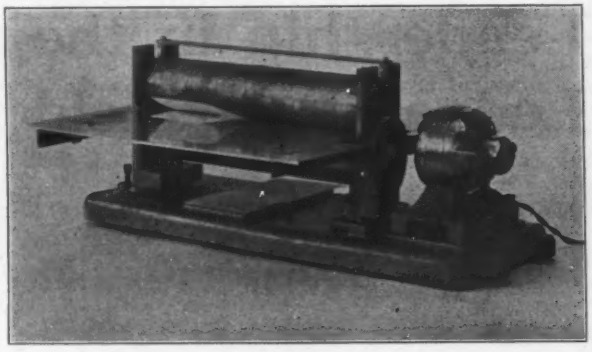

FIG. 1. PHOTOGRAPH OF BABY STACK OF CALENDERS

VI. Recommendations

It is to be recommended that a study be made to determine the best size and weight of steel rolls to be used in the baby stack of calenders and the optimum number of creases to be made. When this has been determined, it is possible that the stacks can be attached to the Mullen tester as an accessory for the convenience of the operator.

ST. MAURICE PAPER CO.

A fairly sharp decrease in gross profits is indicated in the annual financial statement of the St. Maurice Paper Company, Limited (Canadian subsidiary of the Union Bag and Paper Company) for the year ended December 31, 1922. Profits from operations, after deducting all expenses of manufacturing, administration and selling, and after providing for Government taxes, amounted to $696,594. This is a decrease from $1,046,679 in the 1921 year and from $2,440,250 in 1920.

The company, as was the case in connection with all other pulp and paper companies, was faced with comparatively poor conditions during the greater part of the year. So far as St. Maurice was concerned, it was the unfavorable condition of the pulp market which tended to lower gross income, as the company has, as few have, a surplus of pulp for sale. So far as paper sales were concerned the volume throughout the year was fairly satisfactory. At the same time, it was necessary to face the readjusting conditions in both branches and to keep the mill going in spite of the drastic price reversals. Canadian companies entered 1921 with news print at $130 per ton, whereas the prevailing price in 1922 was $70. After deduction of depreciation of $251,518 there remained a net profit of $445,075 equal to 5.63 per cent, earned on $7,899,900 of capital, as against $706,829 or 8.05 per cent earned in 1921. It will be seen that the net showing is considerably better than the gross, largely because of a depreciation write-off in 1921 of $339,950. In the banner year of 1920, net profit was $1,769,989 equal to 23.66 per cent earned on a similar amount of capital outstanding. Dividends paid during the year took up $394,995 as against $631,992 the previous year, leaving the year's surplus at $50,080 as against $74,737 in 1921.

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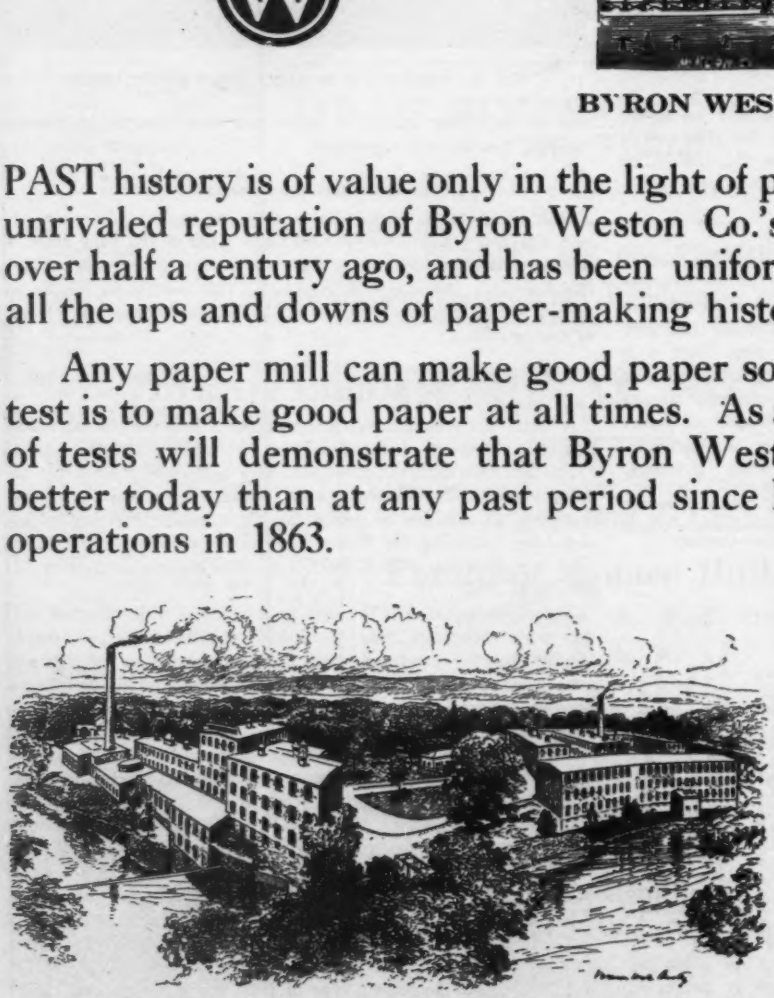

BYRON WESTON COMPANY MILLS, 1923

BYRON WESTON CO.,

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The Effect of Atmospheric Humidity in the Physical Testing of Paper*

By Paul L. Houston, F. T. Carson, and R. S. Kirkwood†

It is generally recognized that paper is affected more or less by the moisture in the atmosphere. It is becoming more and more common to find humidifying apparatus installed in connection with certain industrial processes involving the use of paper. As the margin of quality of paper is reduced to a minimum in the interest of industrial economy, the testing of paper becomes of increasing importance, and greater demands are made on accuracy and reproducibility of results. In order to achieve such results, testing laboratories find it necessary to control by artificial means the condition of the atmosphere of the laboratory with respect to contained water vapor. Although it has been realized for a long time that physical testing is affected by humidity, there is relatively little experimental data to show the significance of the relation. Herzberg[1], Veitch and Reed[2], Kress and Silverstein[3] have published a limited amount of such data. Owing to the incompleteness of data on the subject an investigation was undertaken on a larger scale than had hitherto been attempted, and as a result of interest evinced in the preliminary report, the Technical Association of the Pulp and Paper Industry requested that the Bureau of Standards go into the matter fully and make recommendations. While no pretention is made of exhaustive treatment of the situation, much gratification is felt in the fact that very definite tendencies are shown by the data, that a good idea is had of the relative effect on different physical qualities and that certain general conclusions are made obvious.

In determining the most advantageous means of presenting the data the question arose as to whether the moisture content and physical qualities of paper are expressible as a function of the actual amount of moisture present per unit volume of air, that is of the absolute humidity, or as a function of the relative humidity, that is the quantity of water present in unit volume of air divided by the quantity required to saturate unit volume of air at the temperature under consideration. In short, do the physical qualities depend on absolute humidity or on relative humidity? "The physical properties of many substances vary greatly, depending upon their precise moisture content."[4] There are some data[5] showing the degree of constancy of the moisture content of hygroscopic substances for given relative humidities over a rather wide range of temperatures (and consequent absolute humidities). This fact suggests a significant relation or at least analogy to aqueous solutions. The relative vapor pressure of a sulphuric acid solution for example, varies but slightly with temperature variations. The vapor pressure of hygroscopic moisture in paper behaves, in other words, as if the paper were dissolved in the hygroscopic moisture present. It will suffice to quote a few references to the literature:

"Accurate control of temperature is generally not as important as control of humidity, as the moisture content of most materials varies but little with moderate changes in temperature, providing the relative (not absolute) humidity is kept constant."[6]

"If the relative humidity is kept constant, there is surprisingly little change in the equilibrium moisture content of most substances over the ordinary range of indoor temperature."[7]

"While the equilibrium moisture content of a material varies with both temperature and humidity it changes but slightly with the temperature of the air, the relative humidity of which is held constant."[8]

Davis[9], in experiments to determine the effect of humidity on the expansion and contraction of paper, found that "the dimensions of the paper were practically constant, while the temperature was changed from 70 deg. Fahr., to 90 deg. Fahr., provided the relative humidity remained the same."

"When the absolute humidity is decreased at a constant temperature the dimensions decrease and vice versa, but the absolute humidity alone, without consideration of the temperature, does not determine the dimensions of the paper."

Finally, of the check tests at 45 per cent relative humidity in the series of tests to be described in this paper, the first was made at a temperature of 60 deg. Fahr. and the second at 70 deg. Fahr. The tests checked well and showed no consistent differences to indicate that the lower temperature (and consequent lower absolute humidity) had any effect on any of the physical qualities of the papers tested.

Eleven grades of paper (Table I), obtained from the Government Printing Office, were tested for moisture content, ream weight, expansion and contraction of sheet, breaking strength under tensile stress, elongation at rupture under tensile stress, folding endurance, tearing resistance, bursting strength and thickness. The tests were made in a room in which the atmosphere was maintained for 24-

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†Associated Physicists Bureau of Standards.
[1]Papierprüfung, page 9.
[2]Jour. Ind. & Eng. Chem., vol. 10, no. 1.
[3]Paper, vol. 19, no. 25, and Jour. Ind. & Eng. Chem., vol. 9, no. 3.
[4]Wilson & Fuwa, Jour. Ind. & Eng. Chem., vol. 14, no. 10.
[5]E. g., Lewis, Jour. Ind. & Eng. Chem., vol. 13, no. 5.
[6]Wilson, Jour. Ind. & Eng. Chem., vol. 13, no. 4.
[7]Wilson & Fuwa, Jour. Ind. & Eng. Chem., vol. 14, no. 10.
[8]Lewis, Jour. Ind. & Eng. Chem., vol. 13, no. 5.
[9]Paper, vol. 31, no. 12.

TABLE I.

Identification number	Description	Weight, 25x40, 500, lb.	Thickness, in.	Ash, %	Rosin, %	Fiber content: Rag, %	Chem. wood, bleached, %	Coniferous, %	Manila and jute, %
1.	S. & S. C. Printing	54	0.0029	9.6	1.4	...	100	...	...
2.	M. F. Printing	72	0.0044	24.4	1.0	...	100	...	...
3.	H. M. F. Writing	54	0.0034	2.9	2.2	...	100	...	...
4.	Fine White Writing	79	0.0051	0.8	1.2	100	...	...	...
5.	White Bond	59	0.0040	1.0	1.0	100	...	...	...
6.	Fine White Bond	69	0.0041	0.2	1.0	100	...	...	...
7.	Commercial Ledger	79	0.0046	0.6	1.7	75	25	...	...
8.	White Ledger	163	0.0107	0.9	1.2	100	...	...	...
9.	Index Bristol	269	0.0157	1.0	1.7	50	50	...	...
10.	Kraft Wrapping	60	0.0049	0.3	1.3	...	...	100	...
11.	Rope Manila	90	0.0060	1.6	1.5	...	...	25	75
12.	Wood Writing	49	0.0027	7.7	1.2	...	100	...	...
13.	Rag Writing	55	0.0030	1.3	1.2	25	75	...	...

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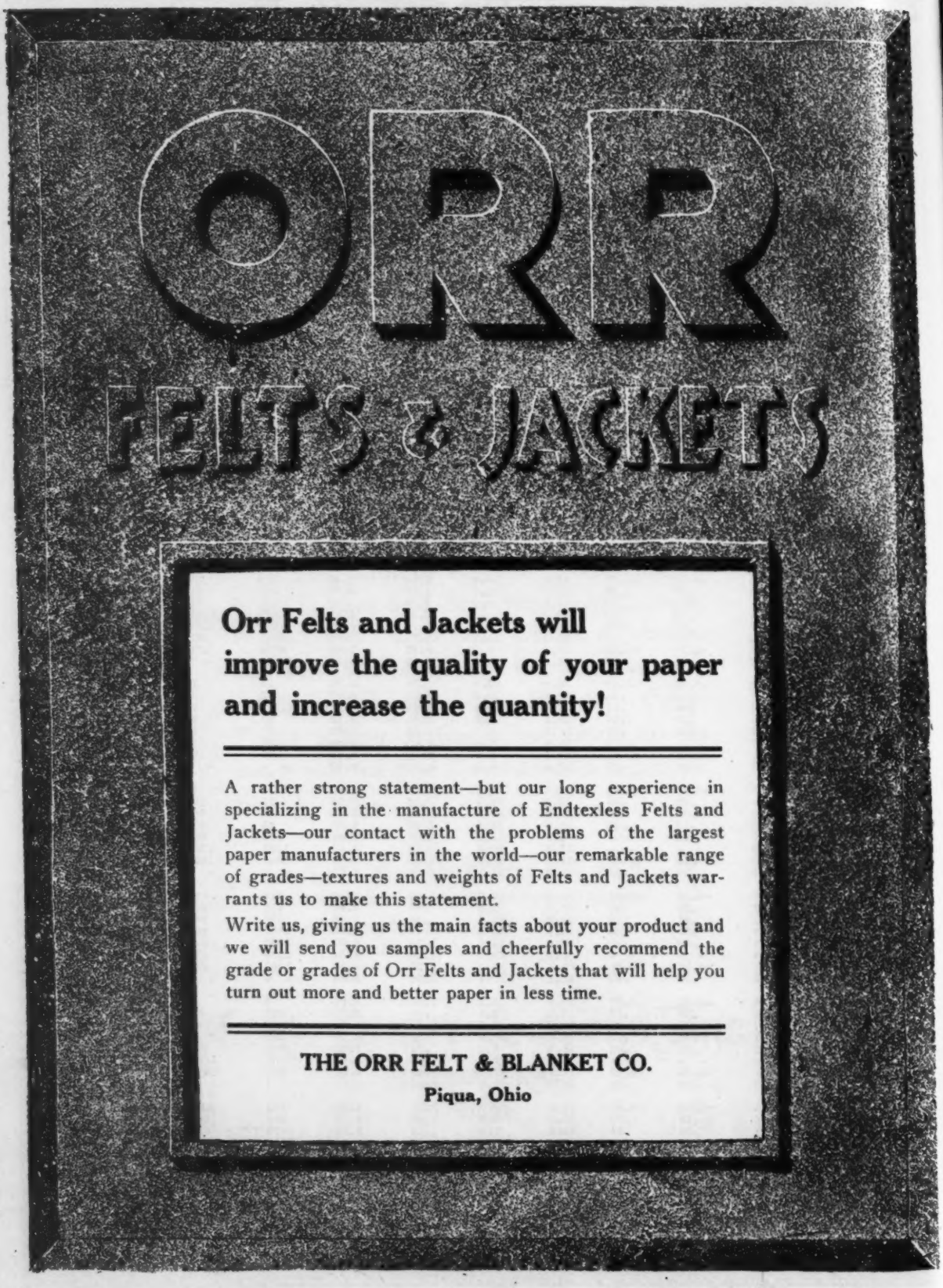
Identification Number	Relative humidity, Per cent	Mean weight 25 x 40-500, Pounds	Expansion and contraction in per cent		Tensile breaking strength in kg.		Elongation at rupture in per cent		Folding endurance Number of double folds		Tearing resistance Grams	Bursting strength, Points
			Machine	Cross	Machine	Cross	Machine	Cross	Machine	Cross		
1	15	51.7	-0.30	-0.37	7.9	5.8	0.40	0.65	- -	- -	18.4	17.3
1	25	52.5	.20	.25	8.0	5.8	.45	.85	- -	- -	21.5	16.8
1	35	52.4	.08	.13	8.1	5.9	.60	1.50	- -	- -	23.4	17.4
1	45	52.8	.05	.01	8.2	5.8	.75	1.34	- -	- -	24.0	17.0
1	55	53.0	.02	.07	7.9	5.5	.90	1.70	- -	- -	24.8	15.6
1	65	53.5	- -	- -	7.6	4.4	1.00	1.80	- -	- -	26.4	15.2
1	75	54.1	+0.10	+0.32	7.3	4.0	1.40	2.40	- -	- -	29.2	15.3
1	83	54.9	.15	.35	6.7	3.7	1.90	3.75	- -	- -	29.6	13.1
2	15	69.7	- -	-0.42	7.6	5.3	0.45	0.70	- -	- -	24.4	17.2
2	25	70.0	- -	.27	7.9	5.4	.50	.90	- -	- -	28.8	17.3
2	35	70.3	- -	.10	8.1	5.4	.66	1.50	- -	- -	31.4	16.6
2	45	70.8	- -	.05	8.0	5.5	.73	1.40	- -	- -	33.2	16.0
2	55	71.2	- -	.07	7.5	5.0	.86	1.70	- -	- -	34.0	15.5
2	65	71.6	- -	- -	7.2	2.7	1.00	2.00	- -	- -	37.6	15.0
2	75	72.5	- -	+0.30	6.8	2.3	1.20	2.70	- -	- -	37.6	14.9
2	83	73.2	- -	.35	5.6	1.9	2.00	3.50	- -	- -	37.8	11.9
3	15	51.3	-0.25	-0.42	8.6	5.9	0.60	0.80	- -	- -	25.0	20.9
3	25	52.0	.17	.25	8.9	6.2	.70	.85	- -	- -	29.0	21.0
3	35	52.2	.07	.12	8.9	6.4	.75	1.00	- -	- -	31.0	21.1
3	45	52.6	.05	.05	9.1	6.3	.75	1.10	- -	- -	31.8	21.3
3	55	53.0	.00	.02	8.6	5.7	.90	1.40	- -	- -	33.6	21.3
3	65	53.6	- -	- -	8.4	5.5	1.00	1.75	- -	- -	34.4	19.9
3	75	54.4	+0.07	+0.27	8.0	4.5	1.50	2.30	- -	- -	38.4	20.2
3	83	55.2	.15	.45	7.5	4.4	1.80	4.45	- -	- -	37.6	18.6
4	15	76.3	-0.20	-0.40	18.2	12.5	1.50	2.75	39	42	80.0	58.9
4	25	77.2	.17	.25	18.4	12.6	1.70	3.35	84	66	82.4	59.5
4	35	77.5	.07	.12	19.0	12.7	2.55	3.80	115	160	91.2	59.6
4	45	77.9	.05	.05	18.5	12.7	2.60	4.63	219	171	90.4	60.2
4	55	78.3	.02	.02	18.0	12.4	2.75	4.10	276	229	89.6	59.5
4	65	79.0	- -	- -	16.9	11.0	3.80	6.00	468	366	92.0	58.9
4	75	80.0	+0.17	+0.32	15.6	6.2	4.50	7.28	697	444	107.2	55.8
4	83	80.8	.25	.50	12.2	6.3	5.73	8.58	- -	- -	125.6	53.6
5	15	56.4	-0.32	-0.47	13.4	9.3	1.30	2.75	10	23	47.6	39.5
5	25	57.1	.17	.30	13.9	9.4	1.50	3.35	29	35	49.6	40.4
5	35	57.5	.10	.17	14.7	9.4	2.00	3.68	36	82	52.4	40.8
5	45	57.7	.05	.07	14.1	9.5	2.03	4.60	58	97	53.6	39.8
5	55	58.0	.00	.05	13.3	8.7	2.15	4.90	69	80	55.2	39.3
5	65	58.6	- -	- -	12.5	8.0	2.23	5.15	93	120	58.4	38.8
5	75	59.7	+0.07	+0.32	11.0	6.1	3.35	6.03	121	124	64.4	37.2
5	83	60.9	.15	.45	10.3	5.4	4.90	8.00	- -	- -	69.2	34.2
6	15	67.1	-0.22	-0.37	18.2	10.6	1.50	3.40	209	252	84.0	58.0
6	25	67.9	.17	.40	18.5	10.7	1.90	4.00	445	456	81.6	58.9
6	35	68.1	.07	.22	18.4	10.7	2.85	5.00	627	715	88.8	59.3
6	45	68.4	.05	.10	18.2	10.5	3.05	5.03	1180	1118	96.0	59.8
6	55	68.8	.05	.07	18.1	10.5	3.35	6.50	1497	1141	100.0	59.8
6	65	69.2	- -	- -	17.7	10.1	4.65	7.80	2298	1727	104.8	56.1
6	75	70.2	+0.17	+0.42	15.3	9.2	4.90	9.41	2500	1710	124.0	55.1
6	83	70.7	.25	.65	12.8	8.6	6.80	10.55	- -	- -	121.2	55.3
7	15	76.2	-0.20	-0.42	15.2	10.0	1.00	2.80	13	29	54.4	41.0
7	25	76.7	.17	.32	16.2	10.3	1.60	3.40	33	41	58.4	42.3
7	35	77.3	.08	.15	16.6	10.4	2.25	4.15	184	92	69.6	43.2
7	45	78.0	.07	.10	16.6	10.2	2.55	4.23	61	85	80.0	42.4
7	55	78.5	.02	.05	15.2	9.7	2.65	4.70	67	79	81.6	40.3
7	65	79.7	- -	- -	14.1	8.6	3.00	5.00	104	107	96.8	39.6
7	75	79.9	+0.17	+0.40	13.2	7.4	4.00	6.00	109	130	109.6	38.7
7	83	80.7	.25	.55	11.4	6.9	4.90	9.00	- -	- -	116.0	37.9
8	15	157.7	-0.27	-0.42	29.0	22.6	1.25	2.80	5	44	- -	86.4
8	25	158.6	.20	.35	31.5	23.3	1.45	3.10	10	164	- -	88.3
8	35	159.8	.08	.15	31.8	23.5	2.13	3.90	43	286	- -	88.8
8	45	161.2	.10	.05	31.5	23.4	2.45	4.45	95	477	- -	88.2
8	55	162.0	.02	.07	28.8	22.3	2.85	4.90	484	648	- -	85.6
8	65	163.0	- -	- -	26.8	20.3	3.20	5.50	1037	1183	- -	85.8
8	75	165.3	+0.15	+0.35	22.8	17.8	4.00	6.88	1649	1269	- -	76.0
8	83	166.8	.30	.55	22.2	17.1	5.45	9.00	- -	- -	- -	73.0
9	15	260.0	-0.10	-0.35	35.0	23.3	0.65	2.00	253	51	- -	92.0
9	25	259.7	.12	.25	37.6	24.5	.75	2.40	612	111	- -	94.9
9	35	262.1	.07	.15	36.3	25.4	.85	2.85	870	236	- -	96.2
9	45	263.7	.05	.05	35.5	25.1	.85	3.25	1070	253	- -	94.6
9	55	264.7	.02	.05	34.6	23.4	1.08	4.00	1262	247	- -	91.2
9	65	268.9	- -	- -	31.7	20.8	1.34	4.38	1139	270	- -	91.5
9	75	273.1	+0.15	+0.30	27.6	18.1	2.00	4.80	1257	327	- -	77.2
9	83	277.0	.25	.45	25.2	17.6	3.00	6.50	- -	- -	- -	76.5
10	15	57.4	-0.20	-0.37	16.8	8.2	0.50	1.50	4	9	53.6	39.3
10	25	58.1	.15	.27	16.8	8.4	.55	1.70	20	25	58.6	40.7
10	35	58.5	.07	.17	16.5	8.3	.60	2.00	58	140	60.0	40.9
10	45	59.1	.05	.10	16.6	8.5	.56	2.15	122	227	58.4	41.2
10	55	59.5	.02	.02	16.4	8.0	.80	2.25	152	356	63.2	40.5
10	65	60.0	- -	- -	15.3	7.9	.94	2.40	582	1252	88.0	41.9
10	75	61.1	+0.05	+0.20	14.4	7.3	1.20	3.45	933	1378	93.6	38.6
10	83	62.0	.15	.30	13.3	7.2	2.00	4.41	- -	- -	82.4	38.9
11	15	86.6	-0.25	-0.90	32.3	8.9	1.00	4.00	260	163	96.8	85.2
11	25	87.4	.18	.50	33.8	9.5	1.20	5.20	498	280	101.6	85.1
11	35	87.7	.08	.25	35.3	9.8	1.55	6.50	914	504	114.4	92.4
11	45	88.6	.05	.15	34.9	9.6	1.58	7.13	2126	835	120.0	85.8
11	55	89.0	.02	.02	32.2	9.0	1.70	8.25	2486	1156	126.4	85.7
11	65	89.6	- -	- -	30.6	7.9	1.75	9.65	5007	1427	147.2	82.2
11	75	91.3	+0.07	+0.35	28.0	7.5	3.00	12.95	10000+	1696	162.4	82.6
11	83	92.9	.15	1.00	27.7	7.1	3.98	14.53	- -	- -	177.6	73.8

Bursting strength only

TABLE II.

	Per Cent Relative Humidity							
	15	25	35	45	55	65	75	83
No.12	17.7	18.6	18.3	17.9	17.4	16.5	15.0	14.0
No.13	26.7	28.1	28.4	28.1	27.5	26.2	25.6	23.4



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hour periods at relative humidities varying by steps of 10 per cent from 15 per cent relative humidity to 83 per cent relative humidity. Due to weather conditions the different humidities were not obtained in order. Two and in some cases three runs were made for each humidity indicated in the data. From 18 to 20 hours were allowed for samples to come to equilibrium with the atmosphere before testing. The investigation covered a period of several months and involved some 16,000 individual tests.

In an investigation of the effect of humidity in physical testing it is most advantageous to present the data as per cent variations from some convenient reference point. Sixty-five (65) per cent relative humidity has been chosen for this investigation, since this is the condition under which paper and similar hygroscopic materials are commonly tested in the industries. Most paper is used

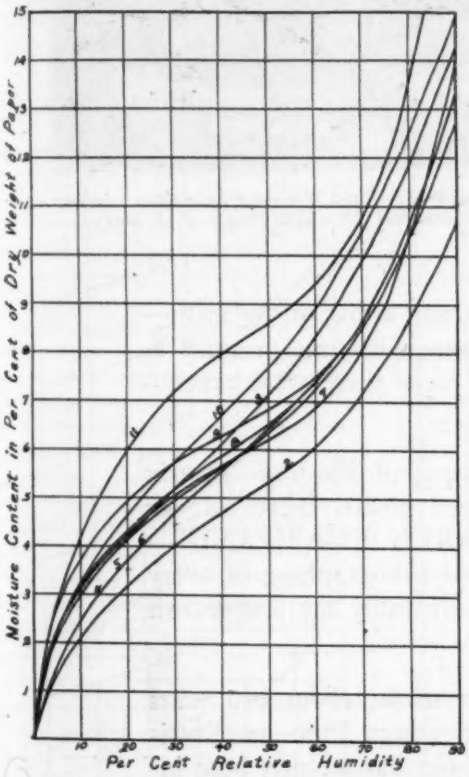


FIG. 1. VARIATION OF MOISTURE CONTENT WITH RELATIVE HUMIDITY

indoors where the average relative humidity is below 65 per cent. Testing at a lower humidity would have the advantage of more nearly approximating the service conditions of paper, but this advantage would be outweighed by the resulting disadvantages, some of which are mentioned below. Although some strength qualities have their maximum values below 65 per cent relative humidity, others reach this maximum considerably above 65 per cent relative humidity. "These conditions (65 per cent relative humidity at 70 deg. Fahr.) have been decided upon rather arbitrarily, yet seem advisable for the following reasons: It is relatively easy to produce the conditions; it is an atmosphere in which it is not uncomfortable to work; these conditions are apparently approximately midway in the increasing and decreasing curves of strength, due to variations of temperature and relative humidity, as indicated by work already done; and, lastly, most of the laboratories which control testing conditions have adopted 70 deg. Fahr. temperature and 65 per cent relative humidity as their standard and have collected their test data under those conditions."[10] It is more expensive to extract moisture from the atmosphere (as would be required by a lower humidity during the warmer months) than to add moisture to it. "There are few laboratories that could afford to install an expensive de-humidifying apparatus for maintaining a relative humidity lower than 65 per cent." Any departure from present practice would fall particularly heavy on the commercial laboratories for the reason that many of them test other materials than paper—leather and textiles for example. There are valid reasons why textiles should be tested at a comparatively high relative humidity. Prevailing practice, both in Europe and America favor the present conditions. The Bureau of Standards, therefore, has adopted and recommends 65 per cent relative humidity at 70 deg. Fahr. as the standard conditions under which the testing of paper should be conducted.

An interesting series of curves might be drawn to show the relation of absolute and specific values (such as ratio of bursting strength to weight, breaking strength to thickness, etc.) for a given humidity. But this is not within the scope of the present paper and would make it unnecessarily long. So far as they might serve any useful purpose the mean experimental values have been included in Table II, for the benefit of any who may desire them. From these tables were calculated the per cent variations from values at 65 per cent relative humidity and the results plotted in graphic form in Figs. 2-9, with the exception of thickness. The thickness data indicate an increase in thickness about equivalent to the per cent increase of moisture content with increase of relative humidity, but are of little quantitative value, since the differences are for the most part comparable with the variance in commercial thickness testers and the ordinary variations in paper.

The essential colloidal nature of paper together with the difficulty of maintaining a constant humidity in a large room over a period of 24 hours preclude the expectation that all experimental points will lie on a smooth curve. But the concordance is very good in most cases, and the effect of changing humidity is quite marked on most physical qualities. The points have been indicated by circles and crosses for alternate curves and the graphs drawn according to the best judgment of the experimenters.

A brief description of the method of procedure is given in connection with the discussion of each property tested. For further details concerning testing devices and methods see Bureau of Standards Circular, No. 107, and Paper Testing Methods (1922) issued by the Technical Association of the Pulp and Paper Industry.

Moisture Content

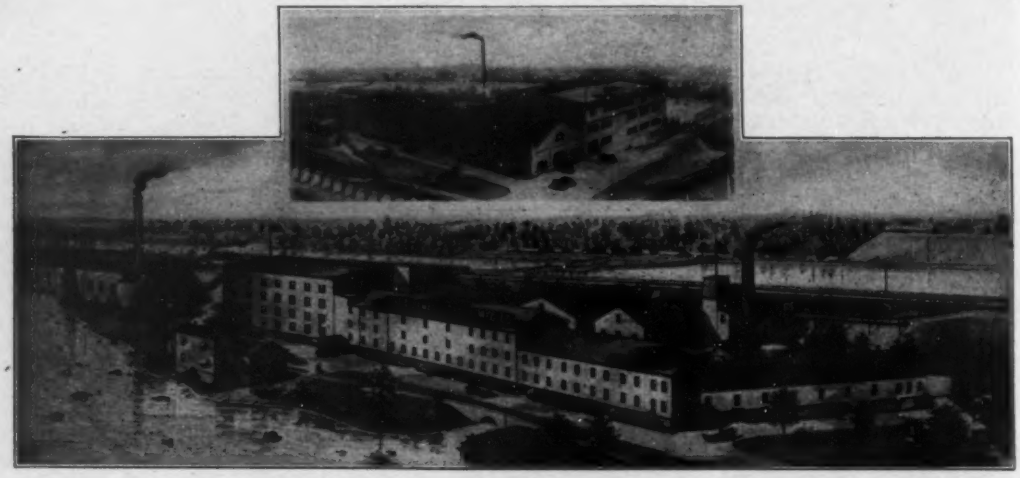
Three representative sheets were taken from each of the 11 grades of paper for each humidity test. After coming to equilibrium with the atmosphere in the humidity room these were weighed separately on a chemical balance. They were then heated to dryness and again weighed, an oven of the type used for the determination of moisture in pulp being employed. The moisture content was then expressed in per cent of the bone dry weight of paper; that is, in per cent variation from the bone dry weight (Fig. 1). Owing to the method employed, the data are not as reliable as in other tests. The literature contains some very good data on moisture content.[11] The curves are of value only in that they confirm the results of other investigators, and that the amount of moisture held in paper for a given relative humidity depends to some extent on the kind of paper.

Ream Weight

Ten sheets, 10 by 10 ins., of each grade of paper were conditioned and weighed on a quadrant scale and the results expressed as ream weight, 25 by 40—500 (Table II), and as per cent variations with relative humidity (Fig. 2). The same samples were used through-

[10] Bureau of Standards Circular no. 107, p. 10.

[11] Wilson and Fuwa, Jour. Ind. & Eng. Chem., vol. 14, no. 10; Campbell, PAPER TRADE JOURNAL, vol. 73, no. 2.



The insert is a view of our Brown's Island Plant, in which we make Kraft and Wrapping Specialties. In our Hollywood Plant (pictured above) we manufacture Bottings, Matrix and Absorptive Papers of all kinds.

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out. It will be observed that all curves are of the same type, the slope and curvature for corresponding points varying slightly from paper to paper. It will be observed throughout that the effect of humidity varies to a greater or less extent (depending upon the test) with the kind of paper tested. As would be expected, these curves are similar to the moisture content curves.

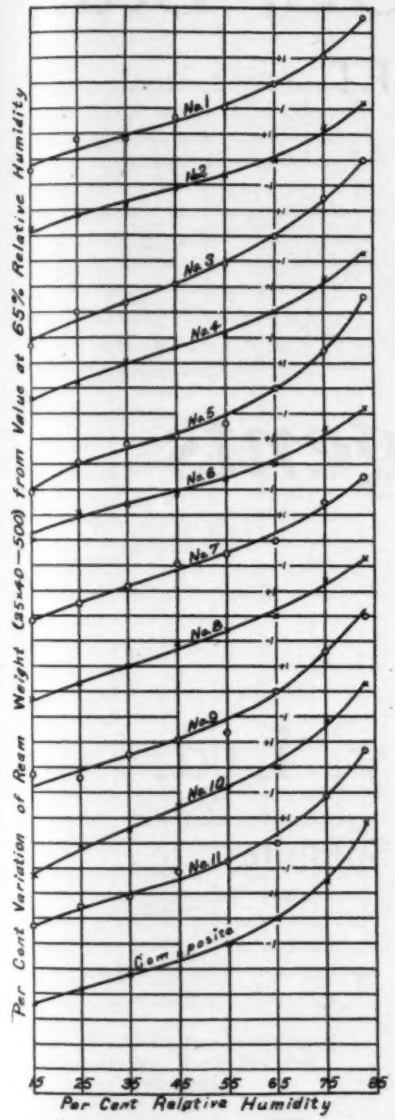

FIG. 2. VARIATION OF REAM WEIGHT WITH RELATIVE HUMIDITY

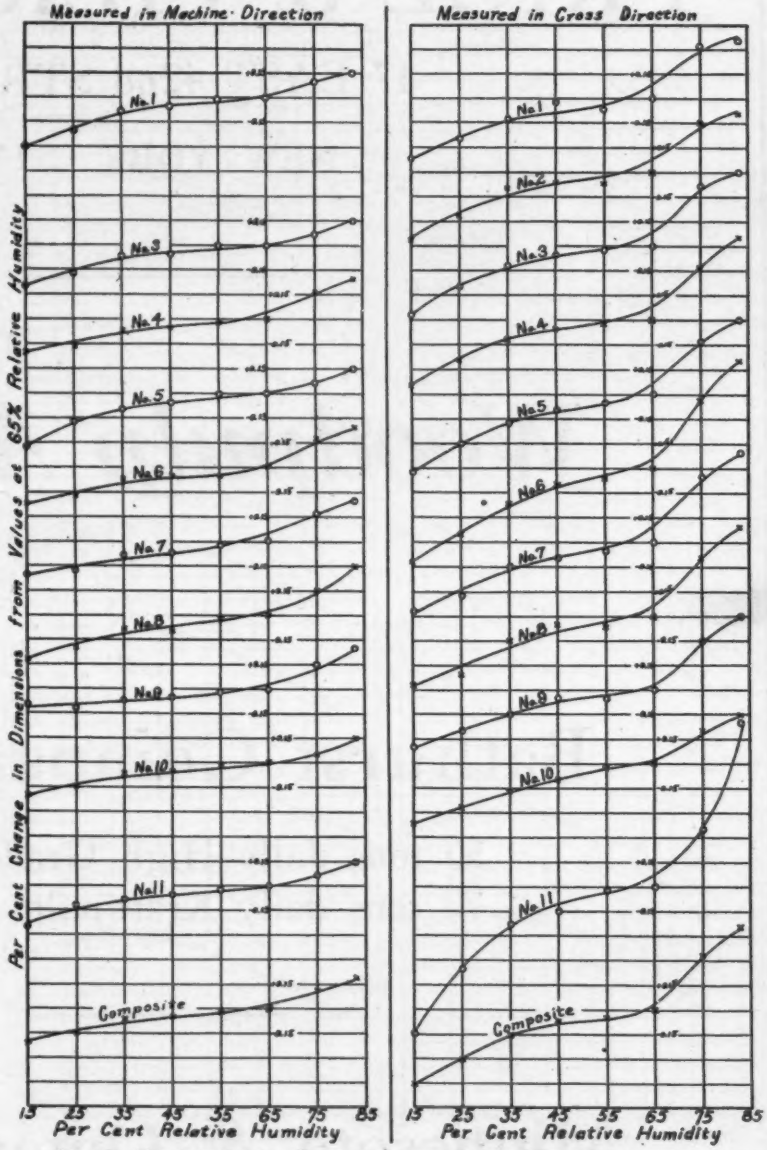

FIG. 3. EXPANSION AND CONTRACTION OF SHEET WITH VARIATION IN RELATIVE HUMIDITY

Expansion and Contraction of Sheet

Three sheets were taken from each grade of paper and pin holes made in each 20 cm. apart in both the machine and cross directions, there being two sets for each direction on each sheet, thus permitting of 6 readings for each direction for each grade of paper and each humidity. The readings were made by means of a miscroscope mounted over a steel scale graduated in fifths of a millimeter. The readings were expressed in per cent change from dimensions at 65 per cent relative humidity. The mean values are given in Table II and plotted in Fig. 3. The effect is seen to be greater in the cross direction than in the machine direction. The variation of No. 11 is unusually large. This property of paper is of particular significance in lithographic or color work in printing. It will be noted that here again the curves, for the most part, are similar to the moisture content curves. But in some cases there is a tendency for the rate of change to decrease with the higher humidities.

Taking into account the expansion of a sheet soaked in water and the amount of water absorbed the resulting point plotted on the same scale indicates that the rate of expansion probably does decrease with the higher humidities. This is in accord with the fact that thickness does not vary greatly over the ordinary range of humidities, but sometimes increases as much as 50 per cent over the dry thickness, when paper is soaked in water. While it is probable that the volume expansion keeps pace with the absorption of moisture, the lateral expansion predominates within the ordinary humidity range while above this range the expansion in

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the direction of the thickness of the sheet predominates.

Breaking Strength Under Tensile Stress

From each grade of paper test specimens 25 mm. wide were cut in both machine and cross directions. Sufficient samples were cut for the whole series of tests planned. But owing to duplication of some check tests it was necessary to prepare new samples toward the last. On this account the data for the highest humidity are uncertain. The test specimens were broken in a Schopper tensile testing machine, the initial distance between jaws being 20 cm. and the speed of descent of lower jaw 12 ins. per minute. Five individual tests were made in each of the machine and cross directions on each grade of paper for each humidity. The mean values in Kilograms are given in Table II, and the per cent variations plotted in Fig. 4. In two cases portions of curves are dotted in, since the points probably do not represent the facts. In practically every case the curves show an increase up to 35 per cent or 45 per cent relative humidity, after which the breaking strength decreases with increase of relative humidity. The relative increase and decrease depends on the kind of paper. It is worthy of note that in general the relative effect of humidity changes on breaking strength is very much the same in machine and cross directions for the same paper. This is not to be confused with the absolute values in the two directions. Paper is, of course, stronger in the machine direction.

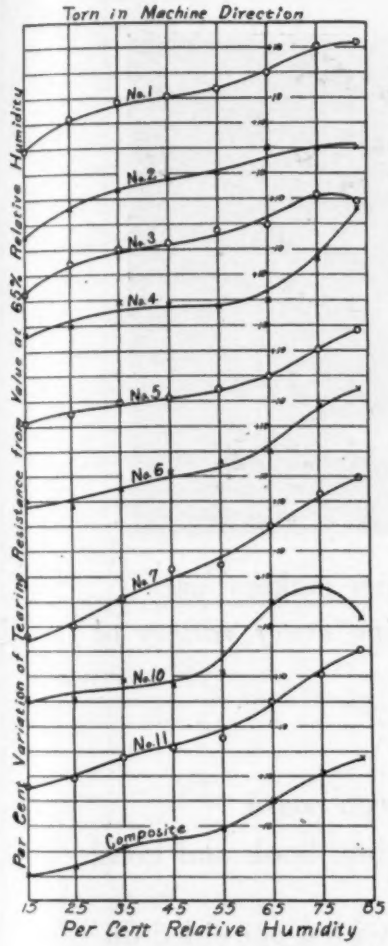

FIG. 7. VARIATION OF TEARING RESISTANCE WITH RELATIVE HUMIDITY

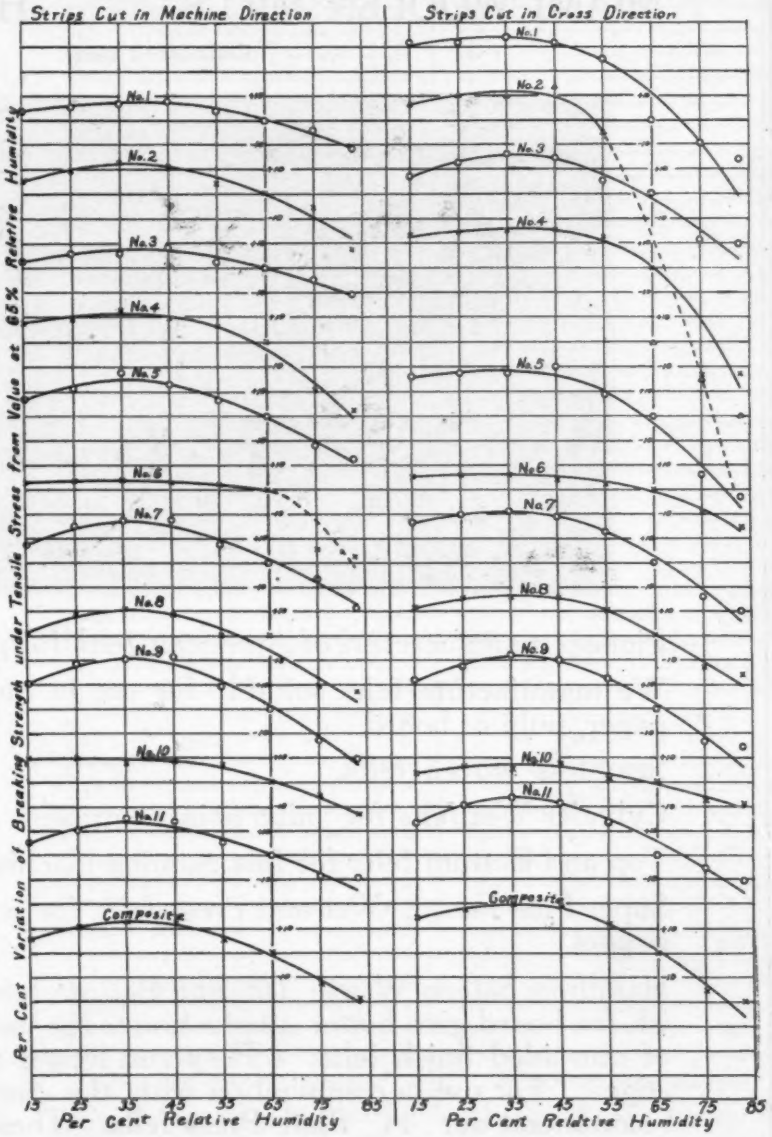

FIG. 4. VARIATION OF BREAKING STRENGTH UNDER TENSILE STRESS WITH RELATIVE HUMIDITY

Elongation at Rupture Under Tensile Stress

Readings were taken at the same time as those for breaking strength and expressed in per cent elongation. The mean values are given in Table II, and the per cent variations plotted in Fig. 5. The curves are similar to the moisture content curves with the exception of a slight initial lag.

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Folding Endurance

The specimens, 15 mm. wide, were prepared in a manner similar to that for the breaking strength tests. A Schopper folding machine was used, 10 tests being made in both machine and cross directions for each humidity on each grade of paper with the exception of No. 1, No. 2, and No. 3, which were too weak or brittle for testing at low humidities. The mean values in double folds are given in Table II, and the per cent variations plotted in Fig. 6. Of the 4 tests ordinarily made the folding endurance is the most erratic and at the same time the most affected by humidity changes. In contrast to the type of curve in Fig. 4, the folding endurance curves show an increase throughout the range tested. In some cases the rate of increase has begun to fall toward the end of the curve. Unfortunately no tests were made at 83 per cent relative humidity. Possibly a maximum would have been realized in some cases. There must be a maximum or peak in the curve at some humidity after 10,000 double folds. The latter portion of the curve was, therefore, dotted in.

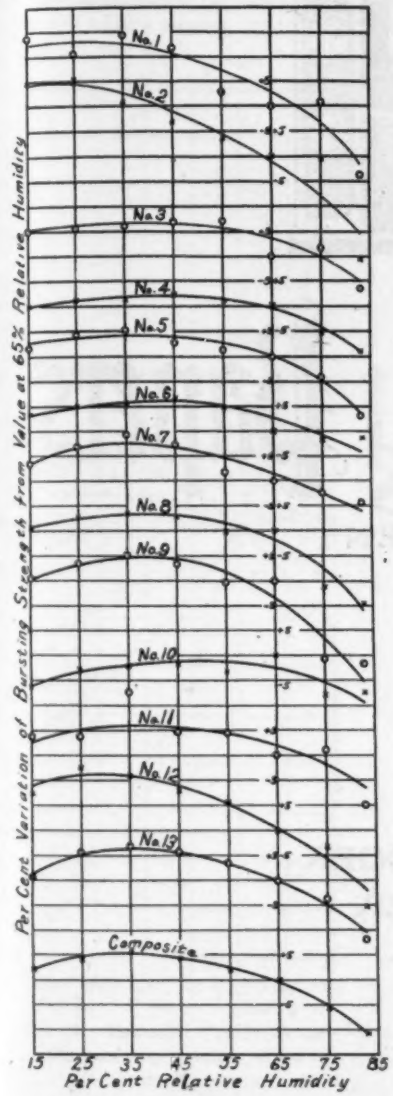

FIG. 8. VARIATION OF BURSTING STRENGTH WITH RELATIVE HUMIDITY

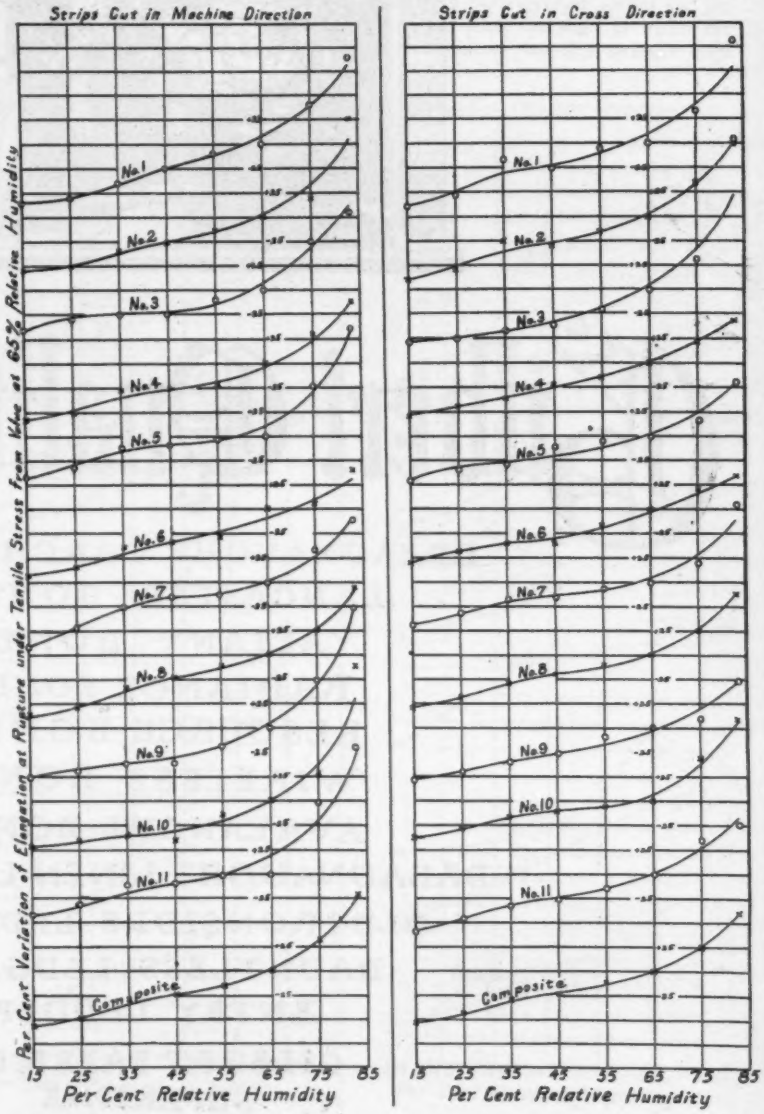

FIG. 5. VARIATION OF ELONGATION AT RUPTURE WITH RELATIVE HUMIDITY

Tearing Resistance

Samples measuring 2½ ins. in the machine direction were prepared and torn in the machine direction on an Elmendorf tearing tester; 4 to 16 tests were made on each grade of paper (except 8 and 9, which were too heavy for the tearing tester used) for each humidity. The results were expressed in grams tearing resistance for one thickness of paper. The mean values are included in

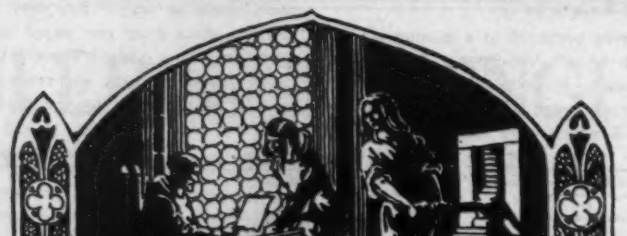

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Table II and the per cent variations with relative humidity plotted in Fig. 7. The variations in tearing resistance are more consistent than are those of folding endurance. The predominating curve is of a sinuous conformation following the moisture content curve in its mid-portion with departures at either extremity. In nearly all cases the rate of change has begun to decrease and in a few cases the maximum tearing resistance appears to have been reached at 83 per cent relative humidity or before. There must, of course, be somewhere a peak of maximum tearing resistance in all the curves since wet paper offers very little resistance to tearing. The manner in which tearing resistance varies with humidity depends to a considerable extent upon the kind of paper tested.

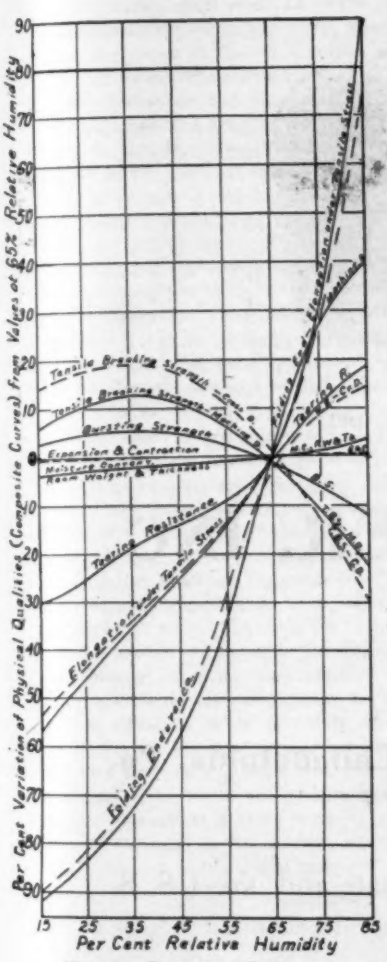
Per Cent Variation of Physical Qualities (Composite Curves) From Values at 65% Relative Humidity
Per Cent Relative Humidity
Tearing Resistance
Folding Endurance
Bursting Strength
Expansion & Contraction
Moisture Content

FIG. 9. RELATIVE VARIATION OF PHYSICAL QUALITIES WITH RELATIVE HUMIDITY

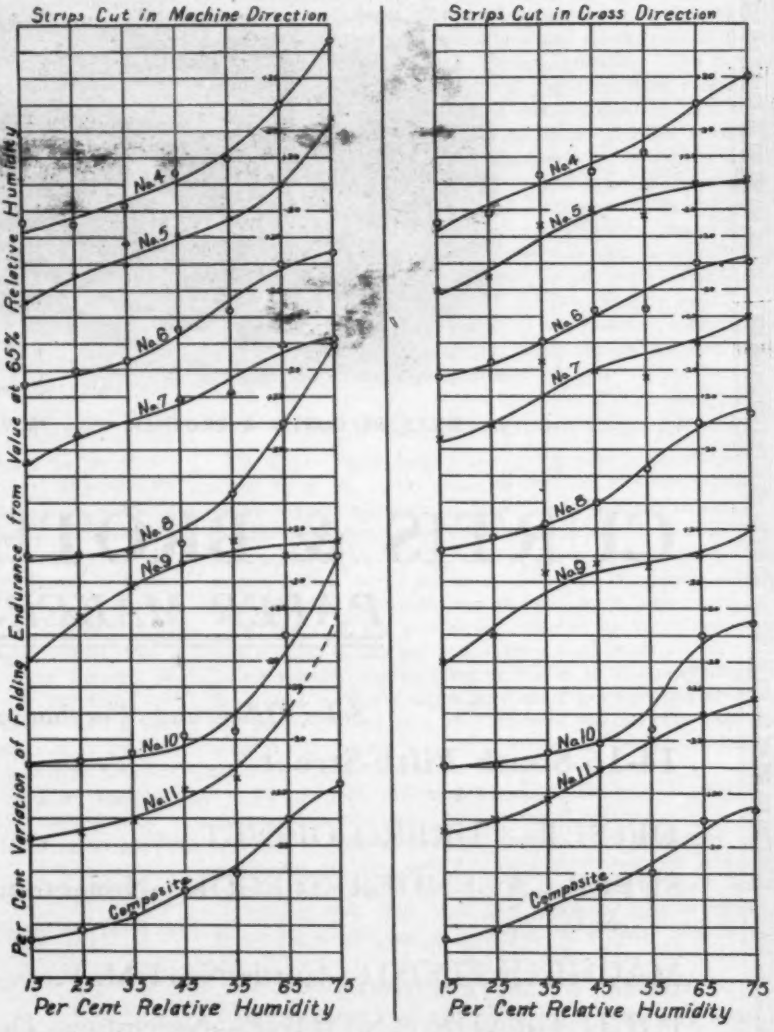

FIG. 6. VARIATION OF FOLDING ENDURANCE WITH RELATIVE HUMIDITY

Bursting Strength

From each of 13 grades of paper sheets were prepared, 6 by 16 ins., and numbered on one edge up to as high as the number of humidity runs planned, in such manner that any given number would fall at different distances from top or bottom of the various sheets. A number was assigned to each humidity and bursts made with a Mullen tester opposite this number wherever it occurred. From 10 to 20 bursts were made on each grade of paper for each humidity. The mean values are included in Table II, and the per cent variations in Fig. 8. It is apparent that the curves are similar in type to those of breaking strength shown in Fig. 4. It will further be noted that the relative degree of variation of the 2 tests with relative humidity is somewhat similar. It is interesting to compare the degree of curvature of corresponding curves for the same paper. But it will be noted from the scale to which the curves are plotted that the variation of bursting strength with relative humidity is not as great as that of breaking strength. The reason for this apparently is that, while bursting strength is not a tensile test it is a function of it and also of the elongation or stretch of the paper tested. With a given tensile breaking strength the bursting strength will increase with increase of per cent stretch. As the tensile breaking strength decreases through the greater portion of the range of humidity tests and the stretch increases over the same range the net result is a decrease in bursting strength, but a less rapid decrease than in the case of breaking strength. It is apparent that the amount of variation of bursting strength with relative humidity is very different for different kinds of paper. It is noteworthy that in a few cases the variation with humidity is within the range of the variation of individual tests at a given

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humidity; that is, for certain grades of paper bursting strength is almost independent of humidity variations except for rather high humidities. It is apparent from a study of the foregoing series of curves and of those in Fig. 9, that, of the strength qualities of paper ordinarily tested, bursting strength is least affected by changes in relative humidity.

Relative Variation of the Properties Investigated

The curves for the different qualities tested were necessarily plotted to different scales. But in order that a good idea may be had of the relative effect produced by changes in relative humidity on these qualities the composite curves were all plotted to the same scale and are shown in Fig. 9. In some respects this is the most important set of curves presented. They show the very large effect on folding endurance and elongation, the considerable effect on tearing resistance and tensile breaking strength and the smaller influence on bursting strength. The variations in expansion and contraction of the sheet are inappreciable on this scale, and yet this variation is of very great importance in connection with certain uses of paper. On this scale the curves for moisture content and thickness are practically identical with that for ream weight and are plotted as a single curve. It is evident from this and previous figures that certain qualities of paper, such as folding endurance, tearing resistance and elongation increase continuously throughout the ordinary range or humidity variations while others, such as breaking strength and bursting strength, decrease throughout the greater portion of this range. This apparent anomaly results from the limited scope of the investigation. If the characteristics of paper were observed over the whole range of variations from the dry to the wet state, maxima would be found for all the curves of strength properties—since wet paper exhibits very little strength and the curves show that dry paper has less strength than slightly moist paper. There are fundamental causes for the radically different behavior of the various strength properties over the ordinary range of humidity variations which it is planned to discuss in a further publication in the near future.

The series of curves shown in Fig. 1 to Fig. 8, indicate that the effect of humidity varies with the kind of paper tested. Fig. 9 further indicates that the importance of controlling humidity depends to a considerable extent upon the particular test under consideration. A study of the preceding figures shows that the slope of the curves for the same property and the same relative humidity varies from one grade of paper to another. It is evident, therefore, that a conversion factor to be used in converting the data to a given test obtained at a given humidity to values corresponding to a different humidity is not possible, except perhaps in the case of certain tests and with a given grade of paper.

Conclusions

For the range of relative humidities investigated (15 to 83 per cent):

Moisture content increases (at varying rates) with increase of relative humidity.

Ream weight and thickness behave in a manner similar to moisture content.

Expansion and contraction with humidity variation is greater in the cross than in the machine direction and the magnitude of the effect depends on the grade of paper.

Tensile breaking strength and bursting strength increase up to the range of 35 to 45 per cent relative humidity, and decrease above this range. The amount of change depends on the kind of paper. The per cent change for breaking strength is practically the same for machine and cross directions.

Elongation increases continuously with the moisture content.

Folding endurance increases over the observed humidity range. There is little concordance of results in machine and cross directions. The variations from one grade of paper to another is most marked.

Tearing resistance increases with relative humidity over practically the entire range of ordinary humidity changes and its behavior depends on the kind of paper tested.

Of the strength qualities considered, bursting strength is least affected by humidity changes, breaking strength and tearing resistance assume an intermediate position while folding endurance is influenced most.

Summary

The results of an extended investigation by the Bureau of Standards into the effect of humidity changes on the physical properties of paper are presented. Data and extracts from the literature are cited to indicate that the physical qualities are determined by relative humidity rather than by absolute humidity. The data are presented as graphs of the per cent variations from values at 65 per cent relative humidity, since this condition is used almost universally in the industries. Eleven grades of paper were tested for nine physical properties at eight relative humidities varying from 15 per cent to 83 per cent. A description of the method of procedure for each test is given and is accompanied by a discussion of results. It is shown that folding endurance, elongation and tearing resistance increase considerably with relative humidity over the observed range; tensile breaking strength and bursting strength increase up to about 40 per cent relative humidity and then decrease; the increase with humidity of moisture content, ream weight and thickness is relatively small and the per cent change of dimensions of the sheet is smaller still.

TO MAKE POTTER BAND BURR

The Potter Band Burr, a new patent pulp stone sharpener invented by F. B. Potter, superintendent of the pulp mill of the DeGrasse Paper Company at Pyrites, is to be manufactured by the International Burr Corporation with factory in Newell Street, Watertown, N. Y. While the local concern manufactures various pulp mill steel burrs and other pulp mill accessories, the new patent will add to the activities of the plant, it is announced.

The new burr was evolved and patented by Mr. Potter about a year ago and he has had it in experimental service on his grinders for six months. Before going to Pyrites he was superintendent of the ground wood mill of the St. Regis Paper Company at Deferiet, and he is regarded as a very practical and scientific man at the business. He claims that very satisfactory results are being obtained by use of his patent.

A. W. Simpson, superintendent of the DeGrasse Paper Company plant, accords the burr a high degree of approval. "It is an ideal burr and it has increased our ground wood production approximately ten per cent with the same horsepower per grinder, has cut the sliver waste considerably and makes it much easier to maintain uniform stock than with any other type we have tried. It will jig more stones per burr than the ordinary burrs.

BARNJUM PRIZES AWARDED

Prizes have been awarded in the Frank J. Barnjum $2,000 prize contest for the most convincing arguments in favor of prohibiting the export of unmanufactured wood from Canada, as follows: First prize for the best essay in English $500 went to J. R. Black, 33 Broadway avenue, Ottawa; second prize $250 to Jas R. Dickson, of Dominion Forestry Branch, Ottawa; Third prize $150 to H. C. Scott, 5 Golf avenue, Pointe Claire, P. Q.; Fourth prize $100 to Fred Barnes, Belgo Paper Company, Shawinigan Falls, P. Q. For the best essay in French, $500 went to Avila Bedard, Quebec, P. Q.; second prize $250 to Albert Trempe, Quebec; third prize $150 to Eugene Rivard, Quebec; fourth prize to Henri Roi, Belgo Paper Company, Van Bruyssel, P. Q. Ontario contributed 185 essays, Quebec 79, Nova Scotia, 130, New Brunswick 79, Manitoba 17, Alberta 20, Saskatchewan 18, British Columbia 17, Prince Edward Island 9.

THE PAPER BUG

When Smith awoke at the new half-million-dollar Hotel Whiting at Stevens Point, Wisconsin, which has just been opened, he was dimly conscious of a peculiarity of atmosphere, but it was not until later that he had even an inkling as to its cause.

He descended to the dining room and noticed the waiters were seemingly in a state of semi-panic. Asking one of them as to the cause of his agitation, he was informed that apparently some one had burned up all the menu cards, as in the place of each on the various tables, was only a little heap of ashes or dust. Smith was not particularly concerned about this, however, as he did not need to consult the card to order. After finishing his meal he pulled out his wallet, in which he remembered he had twenty dollars in paper money, but to his dismay, he found nothing but a quantity of dust.

Smith's keen mind immediately discerned the connection between this disaster, and the affair of the menu cards. He logically deduced that some hitherto unheard-of paper-destroying fungi had been busy during the night.

He was curious to know the extent of their depredations. Stepping into the lobby, he found the magazine rack covered with the same dust, and no magazines. Across the street he found the officers and clerks of the Hardware Insurance Company mourning the loss of their records. At a nearby grocery store, the shelves were a confused mixture of dust, tea, coffee, spices, cleaning powders, and other miscellaneous ingredients, as the paper containers had all been destroyed. The drug store near was in a similar condition. Even the labels on the bottles were gone.

At the post-office the clerks were bewildered; not a letter, or a post-card, or a stamp, in the building. The county officers at the court-house had partially recovered from the shock of finding their records destroyed; at least they were found busy writing out their resignations on pieces of boards. "This mess can never be unscrambled," said one. The officers of the three banks were stunned, not only by the loss of their ordinary records, but also of their currency, bonds, and negotiable paper.

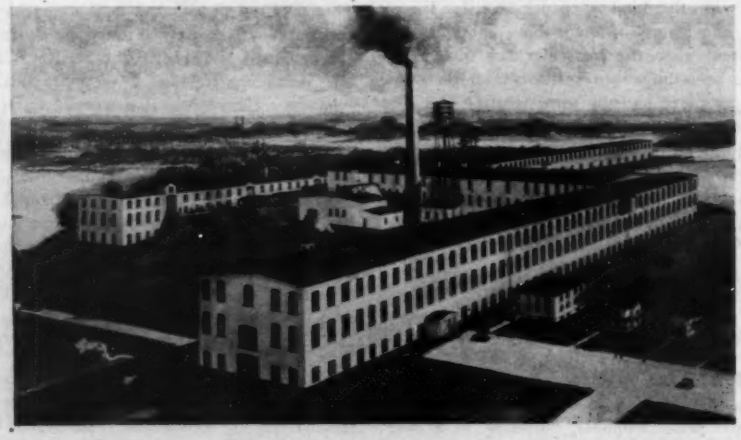
The library was a pathetic spectacle; its shelves empty except for heaps of grayish dust. Noticing a number of school children passing him, Smith asked why they were not in school, as it was now 9:30 A. M. "Some bugs burned up all our books and our writing tablets, so we can't have any school," explained a little boy.

Smith wondered if this catastrophe had affected other localities than Stevens Point, but on inquiring at his favorite news stand, he found they had received no papers, and in fact all of their stock of magazines had been reduced to dust.

Then Smith decided to take Soo train No. 6 to Chicago, hoping he might find that city unaffected by the paper plague, but on arriving at the Station he found the ticket agent had no tickets, as these, too, had perished. But poor Smith could not have purchased one had they still been intact, as not only his currency, but even his check book, had been victims to the terrible blight.

Just then he heard the telephone in his room ringing; it took him some time to realize that he had been dreaming.

"By the Pink Petaled Petunia!" he exclaimed, "I never realized before how indispensable paper really is. I can also understand Whiting-Plover's pride in their product, and their enthusiasm for their pet grades, INTERNATIONAL and ARTESIAN BONDS."



Mill of Whiting-Plover Paper Co., Stevens Point, Wis.

Where INTERNATIONAL and ARTESIAN BONDS are Made

GEORGE A. WHITING PAPER CO., MENASHA, WIS.

Associated Mill

PAPER EXPOSITION IS BIG SUCCESS

Representative Firms in the Paper and Allied Lines Make Splendid Exhibits in the Grand Central Palace, New York

First Paper Show Attracts Many Pulp and Paper Men in Town for the Annual Convention of the American Paper and Pulp Association, Large Consumers of Paper and the General Public—Serves to Impress the Importance and Vast Extent of the Paper Industry of America on Numerous Visitors Throughout the Week—Wide Variety of Machinery, Paper Makers' Supplies and Manufactured Paper.

By Dr. Arthur Selwyn Brown and Herbert J. Laughton

The first Paper Industries Exposition opened at the Grand Central Palace, New York, on Monday, April 9, with a magnificent display of exhibits illustrating the paper-making and allied industries. It was evident to visitors that the leading firms in the trade had spared no expense in making their exhibits representative. This resulted in an interesting, highly instructive and successful exhibit. Its success did not depend upon any special feature but upon a number of contributing factors. These included the hearty co-operation of many of the leading firms, the intrinsic importance of the exhibits, the splendid manner in which the various booths were furnished and decorated and the efficiency and high character of the officials representing the exhibiting companies.

The exhibits included many of the principal machines used in the manufacture of paper and paper products; samples of the various woods used or capable of being used in making paper pulp; various types of pulp, papers and paper products and goods. There were many novel machines, models of improved processes and samples of by-products which afforded much interest to the members of the paper industry who were attracted to New York by the American Paper and Pulp Association Convention.

Wide Uses for Wood Pulp

Visitors were enabled to get an insight into the immense national value and importance of the pulp and paper industries. While the principal use of wood pulp is in the manufacture of paper, it is capable of being effectively used in the manufacture of a multitude of useful articles. Exhibits showed paper-laths and paper-boards used in many industries; fiber rods, pipes and tubes, capable of wide employment; rosin, pine oils, turpentine and other important raw materials which are extracted from the wood before it is pulped; wood flour and pulp used in the manufacture of linoleum, dynamite, gun-powder, phonograph records; chemicals used in the pulp and paper industries and many other articles and substances.

The interest of the U. S. Government in the paper trade was shown by several government booths which included the Bureau of Standards, the Forest Service and the Paper Division of the Department of Commerce. The New York State and City exhibitors were the State College of Forestry and the New York Public Library.

An exhibit which attracted the admiration of many visitors, and indicated the vast field modern inventions have opened out for the use of pulp, was a handsome rug, manufactured from paper by the National Fiber Textile Company, Neenah, Wis. This fine rug is printed in art color designs and is strong, serviceable, sanitary, fire-resisting and waterproof. It is made by spinning kraft and sulphite paper strips in a special manner and weaving in the ordinary way. Some furniture, consisting of a chair and writing desk, made of paper and paper board in imitation of wicker furniture was also a striking exhibit.

The opening up of new uses for pulp and paper, naturally, demands increased pulp supplies. In view of the limited supplies of spruce, the prevention of future paper famines is attracting the attention of experts in the paper industry. Evidences of this are shown by numerous exhibits from proposed methods of reforestation, to processes for manufacturing pulp from highly resinous woods and grasses and reeds.

Importance of Reforestation

No matter how well reforestation is practiced, it requires long periods of time for worked-over forest lands, or fire-swept areas, to be brought back so as to become valuable yielders of pulp material. Chemists are turning their attention to the preparation of resinous woods and hardwoods to enable them to be used in addition to spruce for paper making pulp. An exhibit of sulphate fiber made from yellow pine woods from the Southern States by the J. H. Wallace & Co., chemical engineers, shows the possibility of recovering immense quantities of pulp from worked over timber areas and from Southern pine forests which is suitable for the manufacture of kraft paper by the sulphate process after the chips have been submitted to a treatment which eliminates, or greatly reduces the rosin contents. Even saw-mill refuse which is so plentiful throughout the Southern States, can be utilized in pulp-making by improved sulphate processes.

A Representative Exhibit

The machinery exhibits were numerous and representative. They varied from large rotaries and centrifugals to delicate paper weighing and grading appliances.

Chemicals employed in different paper industries were in evidence in many booths and some extensive exhibits were made of all classes of paper, paper goods, bags, paper plates, cups and vessels, artificial silks made from viscose, ropes, twines and many articles manufactured from pulp and paper.

The industry's first great exposition in New York made a memorable impression upon the crowds of visitors and served to impress the American people with the extent and importance of the paper and allied industries. It was a pronounced success.

Bagley & Sewall Co.

The large booth of the Bagley & Sewall Company contained drawings, diagrams, models and pictures of paper making machinery made by this company. Among the machines exhibited was the large recently invented dam, or slice-bar which is found more efficient in high speed work than the usual type. Mill men were particularly interested in a new type of dryer-syphon of the kind recently installed in a Kalamazoo mill by this company.

The Home of the A. P. W. Paper Co.

In the left hand panel is shown the main office and converting plant. The building is 200x300 feet and has 120,000 square feet of floor space

At the right is shown the A. P. W. Paper Co.'s Liberty Mill, a concrete and brick single story structure, 300 x 360 feet, having an annual capacity of more than 10,000 tons

Two modern brick and concrete buildings—a complete equipment of the most up-to-date automatic machinery known to the paper industry—airy, sun-lighted mill and converting plant—such is the home of the A. P. W. Paper Co.

From these two plants come the finest grades of toilet paper and paper towels on the market today. The company produces its pulp from spruce logs cut from its own Vermont forest. The water used in making the paper is clear and uncontaminated, being obtained from a subterranean stream, happily discovered 500 feet beneath the mill. Three wells supply more than two and a half million gallons a day.

Added to these advantages, an army of expert paper makers, seasoned in the Company's principles of integrity, and ideal power and terminal facilities make possible the maximum quality production at minimum cost.

Branch Offices and Salesrooms

ATLANTA
2 Walker St.

BOSTON
79 Milk St.

BUFFALO
Ellicott Sq.

CHICAGO
508 So. Dearborn St.

CINCINNATI
2850 Pine Grove Ave.
Hyde Park

CLEVELAND
723 National City Bldg.

COLUMBUS
1288 Bryden Rd.

DALLAS
400 So. Lamar St.

DENVER
1765 Race St.

DES MOINES
409 Youngerman Bldg.

DETROIT
119 W. Woodbridge St.

HARTFORD
9 Lenox St.

INDIANAPOLIS
616 Terminal Bldg.

KANSAS CITY
716 Lee Bldg.

LOS ANGELES
322 East 3rd St.

LOUISVILLE
1618 Francis Bldg.

MILWAUKEE
218 Florida St., Sta. A

MINNEAPOLIS
3527 Pleasant Ave.

NEW YORK
200 Fifth Ave.

PHILADELPHIA
1001 Chestnut St.

PITTSBURGH
1536 Oliver Bldg.

ST. LOUIS
445 Frisco Bldg.

SAN ANTONIO
801 W. Mistletoe St.

SAN FRANCISCO
228 Balboa Bldg.

SYRACUSE
309 Gurney Bldg.

TOLEDO
317 12th St.

APW
Quality Toilet Paper Products

A. P. W. PAPER CO.. Albany, N. Y.

JOHN LACKNER CO.
Long Island City, N.Y.
UNIVERSITY
PULP and PAPE
NAVAL STORES DIVISION
HERCULES WOOD ROSIN
HERCULES POWDER CO.
W. C. & M. W. TALCOTT
BELT FASTENERS
CAYUGA LINEN and COTTON MILLS
Auburn, N.Y.
CAYUGA
TWINES

SOAPSTONE LININGS

FOR
SMELTING FURNACES
IN
SODA
KRAFT
SULPHATE
PAPER MILLS

SELECTED WITH CARE
INSURE SATISFACTORY SERVICE
SHIPPED BY RAIL FROM OUR OWN QUARRIES AND MILLS
USED THROUGHOUT THE UNITED STATES AND CANADA
RECORD OF SERVICE AND PRODUCTION ESTABLISHED

ALBERENE STONE COMPANY

153 West 23rd. Street
New York City

1700 Elston Avenue
Chicago Ill.

In addition to the effective syphon valve, this dryer is remarkable by reason of the method employed in grinding and finishing the journals and gear fit and their internal boring. The aluminum paper rolls for carrying paper from the couch to the first felt was also a novelty shown. These rolls are operated by air jets propelling small turbines at the driving end. Table rolls felt rolls and wire guide rolls were shown which embodied new features. These included ball bearings giving a perfect balance. Interested mill men found many ingenious devices embodied in the machinery manufactured by this company.

National City Paper Corp.

Many types and sizes of Schopper standard paper testers were shown in constant operation int the booth of the National City Paper Corporation. These instruments were handsomely made and as they were operated on various classes of paper, by experts they naturally attracted much attention from visitors. The folding endurance tester and the gauge cutter which makes the paper strips which are tested were admitted by papermakers to be indespensible instruments in mill equipment. The Schopper Rapid Paper Tester, designed for making quick tests for paper buyers and users was another of the company's exhibits which made a marked impression on visitors.

The complete history of paper-making, from the felling of the forest trees to the printing and working into bags and other forms of the finished paper, was shown by the Union Bag and Paper Corporation. This was done by paintings and samples of spruce logs, chips, pulp and other samples of paper undergoing the manufacturing processes. An unusual feature of this company's exhibit was the extensive display of paper bags from fancy duplex bags down to coal and feed sacks. Most of these bags were printed in colors in the company's own printing plants and among these were samples of bags printed in fancy designs on all four sides. This was made possible by means of the company's patented processes for making the bags from printed paper. The color designs and printing forms are all made by the company's own artists. The grocery bags shown were in numerous grades, shapes and a full range of sizes. The interesting feature in these was "Not-a-seam," these bags having no visible seam. The exhibit created the impression that every form of bag and every requirement of bag users can be handled by this company.

Gibbs-Brower Co.

The Gibbs-Brower "Go-Between" bulletin which features the methods of this firm of paper and pulp mill brokers was shown to many interested visitors. This firm's booth was used as a lounge and rest room for the visiting papermakers. The Gibbs-Brower Company has developed a large and prosperous business in the selling of paper and pulp mills and used paper and pulp mill equipment. The booth had as one of its ornamental features a large scale map of the United States and Canada, with the paper and board mills suitably indicated, as well as shipping locations and figures showing the daily production capacity of the mills.

H. Reeve Angel & Co., Inc.

News print rolls and sheets, and book and printing papers in a number of colors, weights and sizes were exhibited by H. Reeve Angel & Co., Inc.

Cameron Machine Co.

Roll winding machinery and slitting machines were shown in operation by the Cameron Machine Company. Samples of rewound rolls made by the machine exhibited were freely distributed to visitors as souvenirs.

Farnsworth Co.

Paper drying by the New Farnsworth System and the condensation pump which is an important feature of this drying system were shown by the Farnsworth Company, Norristown, Pa.

A gyratory screen suited to screening liquid clay filler, coloring, paints and other liquids employed in the paper industries was featured by the Great Western Manufacturing Co., Leavenworth, Kansas.

Hermetite Chemical Corp.

A transparent liquid employed for sealing the pores of paper and other substances known as "Hermetite" was shown by the Hermetite Chemical Corporation. It waterproofs paper and fabrics, rendering them steam and air tight. It has a variety of uses in the paper trades, being used in strengthening tissue papers, preparing wall papers so that they can be cleaned as readily as porcelain, and for protecting sealed paper packages and wrappers.

Pequot Mfg. Corp.

Corrugated fiber shipping cases, slotted cartons, calendar mailers, double-faced partitions, tubes, wrapper and many other corrugated fibreboard products were shown by the Pequot Manufacturing Corporation. Printed shipping boxes were featured by this company as the advertising chain linking manufacturers with dealers and consumers.

S K F Ball Bearing Corp.

Ball bearings are now universally used in all high-grade machines and mechanisms. The S K F Ball Bearing Company displayed numerous types of self-aligning ball bearing hangers for shafting and bearings for the bearing surfaces of paper and pulp mill machinery. One of the attractions at this exhibit was a ball-bearing trunnion for dryer cylinders weighing nearly 1,000 pounds. This mounting has been successfully applied and has created considerable interest among paper manufacturers. Shown in operation were several self-aligning and deep groove bearings. Somewhat of a novelty was a fly wheel mounted on ball bearings so sensitive that the weight of a dime started the wheel revolving. When once started this model will revolve for five hours under its own momentum. Service engineers of SKF Industries were on hand to answer questions regarding the application of ball bearings to paper mill machinery.

Mathieson Alkali Works

The alkali industry furnishes some of the basic chemicals for the pulp and paper industries. Improvements in the production and costs of alkali react favorably in the paper industries. The fine model of the Mathieson Alkali Works, Inc., showing a complete alkali works operating on the Mathieson system was instructive to visitors. This system presents a marked improvement, revolutionary in character, over the old method of preparing bleach liquor from bleaching powder. Liquid chlorine is absorbed by milk of lime under such conditions that the temperature is under control at all times and a uniform strength of bleach liquor is thus assured. As a matter of technical information it may be noted that when liquid chlorine reacts with a solution of hydrated lime considerable heat is generated. Should this heat be allowed to become excessive at any time during the operation decomposition ensues with a consequent loss of bleaching power of the solution. The Mathieson system controls this heat by means of the coil passing through the milk of lime solution, in which the chlorine passes from the liquid to the gaseous form. In expanding in this coil, the chlorine becomes very cold and absorbs heat from the solution thus keeping the temperature within safe limits. The successive steps in the production of bleach liquor by the Mathieson system were demonstrated by means of the model. Samples and printed matter of "Eagle Thistle" products were shown, these including caustic soda, soda ash and bleaching powder.

Cayuga Linen & Twine Co.

The exhibit of the Cayuga Linen and Cotton Mills, Inc., of Auburn, N. Y., comprised samples of finished and unfinished twines, four prominent brands being featured—the Cayuga White Finished, the Burlifibre, the Indacol and the Gratine. In addition to twine, the forms and methods of packing were illustrated, a number of new and unique ideas of this nature being shown. What is said to be the largest photograph of a ball of twine was also

VOITH CATERPILLAR GRINDER

Patented in Canada Patent applied for U. S. A.

Continuous Process

Manufactured
For
4-Foot Wood
2-Foot Wood

Highest Production

Per Unit at Minimum Power Per Ton. Uniform High Grade Pulp.

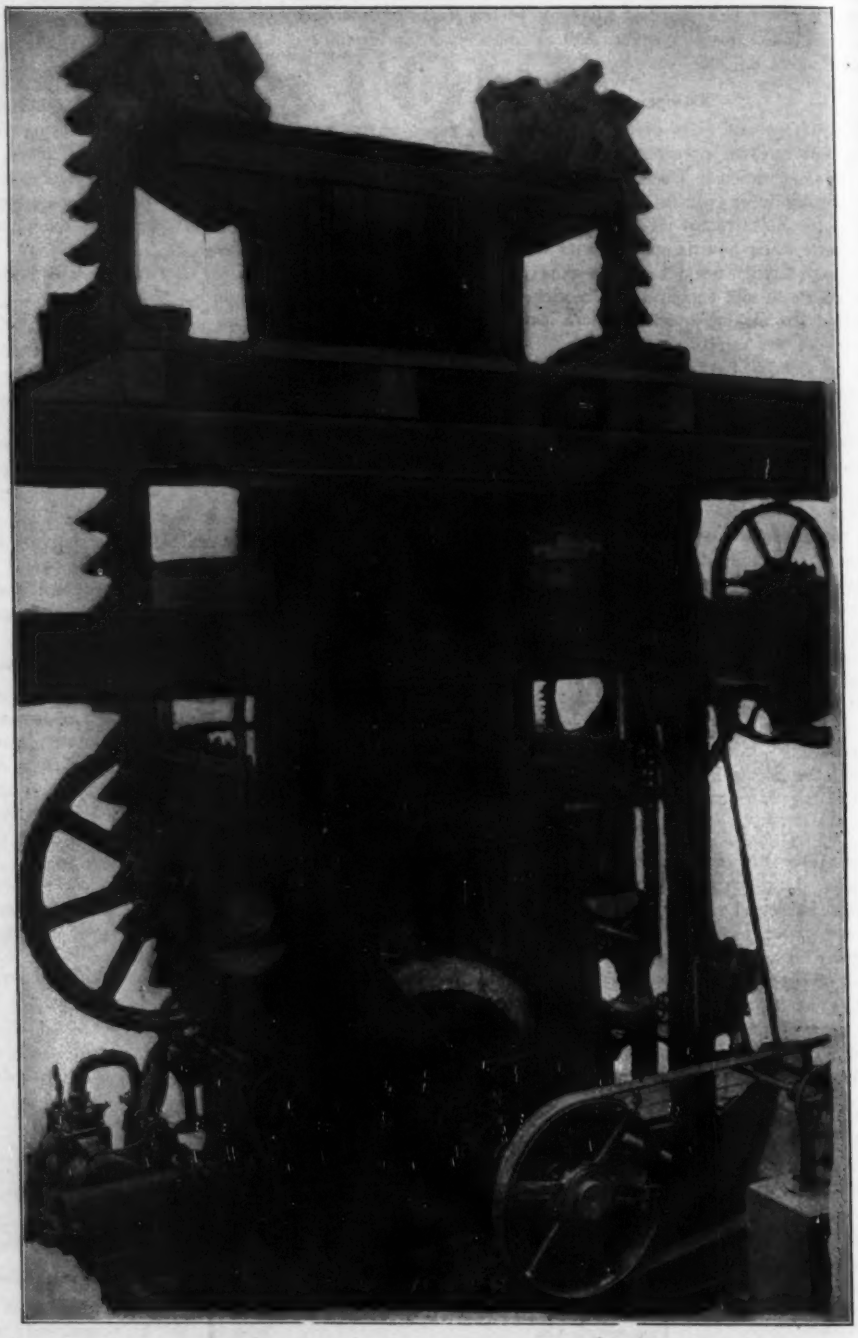
Grinds Logs

Up to 30 Inches Diameter, Slabs, Edgings, split Logs and Saw Mill Refuse.

Mechanical Feed

only, no pressure pumps or pistons, eliminating customary pipe lines.

Low maintenance cost. Perfect Feed Regulation.



F. o. b. Manitowoc, Wis., or Brantford, Ontario.

AMERICAN VOITH CONTACT CO., Inc. 281 MADISON AVE. NEW YORK

shown. The booth was in charge of expert twine men who answered all questions in an intelligent manner.

Electric Bleaching Gas Co.

A model of a bleach plant for the use of liquid chlorine was exhibited in the booth of the Electric Bleaching Gas Company, of New York. The model was complete in every detail and afforded an excellent idea of the operation of the system, the entire process being readily visualized from the model. Some thirty pulp and paper mills are now using the process.

Voorhees Rubber Mfg. Co.

The Voorhees Rubber Manufacturing Company, of Jersey City, N. J., exhibited the Sensation V. high speed belting, water hose and Rub-steel valves. The booth was decorated with appropriate trimmings of trademark designs, literature and samples of specialties for paper mill use.

William Bond Wheelwright

William Bond Wheelwright, of Boston, Mass., displayed some clever and ingenious samples of advertising for the paper and allied industries.

Alfred Bleyer & Co.

Paper plates, picnic plates, paper bags and paper sacks were exhibited by Alfred Bleyer & Co., of Brooklyn, N. Y., who make a specialty of manufacturing these useful articles. A feature of the booth was the display of two brilliantly colored panels which illustrated how paper plates can be used "Out of Doors" and "In the Home."

Dendro Chemical Exhibit

An instructive exhibit that attracted many visitors was that prepared by Dr. H. O. Chute, chemical engineer, showing the various chemical products of the forest. The exhibit was displayed under the title of "The Dendro Chemical Exhibit" and was prepared in order to show the paper industry how to utilize all the possible products of the forest instead of having each man take what he needs and permitting the rest of the product to be wasted.

Institute of Industrial and Domestic Arts

The Institute of Industrial and Domestic Arts, of Gardenvale, Quebec, Canada, demonstrated the work of the students of the institute and explained to the visitors to the show the various correspondence courses in elementary science, mechanical pulp, sulphite pulp, sulphate and soda pulp, beating and coloring, paper machine operation and paper finishing. Incidentally, the courses are conducted under authority of the Canadian Pulp and Paper Association.

Endura Mfg. Co.

The display of the Endura Manufacturing Company, of Philadelphia, Pa., consisted of an exhibition of "Endura" Sheet Packing, "Duraflex" Covering, and samples of various materials specially treated on paper base. The "Endura" Sheeet Packing is made for use against oils, greases, gasoline, coal tar, alkali, water, etc., and has been adopted by most of the big automobile companies. "Duraflex" Covering is principally used as a shoe cover and toe cap liner and is tough, pliable, cuts easily and stretches enough to fit the shoe snugly, but does not pull out of shape.

Hammermill Paper Co.

One of the largest and most attractive booths in the show was that of the Hammermill Paper Company, of Erie, Pa. Hammermill papers were tastefully exhibited from the raw material to the finished product, with a special exhibit of Hammermill Bond Social Stationery by the White & Wyckoff Manufacturing Company, of Holyoke, Mass. Hammermill envelopes, cabinets and announcements were shown by the P. P. Kellogg & Co., Division, of Springfield, Mass., and the National Envelope Company Division, of Waukegan, Ill. Along the front of the booth illuminated panels were displayed to show the progress made in paper making.

New York Public Library

The New York Public Library had an exhibit showing the experiments made by the library to conserve newspaper files. Files of New York newspapers several years old were shown, well thumbed and dog-eared through constant wear, and so much deteriorated that further use was impossible. Other copies of the same period were shown which had been treated with Japanese tissue paper. These copies are easy to read as the pages are not crushed or ragged, but each page stands out individually from the bound file copy.

U. S. Department of Commerce

The display of the U. S. Department of Commerce was subdivided into individual exhibits of the Bureau of Foreign and Domestic Commerce and the Bureau of Standards. The work of the Paper Division and what it means to the paper and allied industries was emphasized and photographs of equipment, testing apparata, samples of paper, charts and pictures were featured.

G. D. Jenssen Co.

The G. D. Jenssen Company, of New York, demonstrated the "Jenssen Tower Acid System," and showed how great amounts of money can be saved yearly by adopting this method. This exhibit included photographs and prints of the "Jenssen Tower Acid System," and of the "Kamyr Feltless Wet Machine and Drying Machine," with illustrative maps and statistical tables.

New York State College of Forestry

The unique and instructive exhibition of the New York State College of Forestry at Syracuse University included a set of transparencies showing reforestation projects from barren land to mature timber; panels of framed pictures showing (a) fire destruction and protection and (b) the paper and pulp laboratories of the New York State College of Forestry and a set of living models showing types of trees, in various stages of growth, which are in chief use for reforestation of idle land in New York State. This feature was appropriately entitled "How Big Trees from Little Seedlings Grow." Charts, legends, etc., were also displayed to show the status of reforestation in the Empire State.

Hercules Powder Co.

Another interesting exhibit was that of the Hercules Powder Company, Naval Stores Division, of Wilmington, Del. The adaptability of Hercules Rosin for use in paper sizing was ably demonstrated and samples of various types of papers sized with this product were displayed. Much research work has been accomplished by the Hercules Powder Company to determine the properties of rosin required for satisfactory sizing results and paper manufacturers have benefited accordingly.

Paper Makers Felt Industries

One of the most comprehensive exihibts in the Show was that of the Paper Makers Felt Manufacturers' Industrial Council, which consisted of a display of paper makers' felts and jackets. This booth was occupied jointly by the members of the felt industry associated under the Armstrong Bureau of Related Industries and included the following well-known concerns: The Albany Felt Company, the Appleton Woolen Mills, Draper Brothers Company, F. C. Huyck & Sons, the Knox Woolen Mills, the Lockport Felt Company, Shuler & Benninghoffer and the Waterbury Felt Company.

Sandusky Foundry & Machine Co.

A striking exhibit was displayed by the Sandusky Foundry and Machine Company which consisted of a large Millspaugh Suction Roll for high-speed paper machines, equipment with roll balls, anti-friction bearings, such as have made speed of 1,000 feet and upwards practical. Roll-ball anti-friction bearings for paper machine driers

ANNOUNCEMENT

Re. Unfair Practises In Gummed Tape Manufacture

IT has been customary for some manufacturers of Gummed Sealing Tapes to cut the manufacturing cost of their product by using papers weighing less than the weight names of the tape would indicate. For instance 32, 33 or 34 pound kraft have been used in the manufacture of 35 lb. tape, and 55, 57 or 59 pound in making so called 60 lb. tape.

The Gummed Paper Manufacturers' Association feels that this practise has reached such proportions that the gummed sealing tape industry is in danger of being seriously harmed by the quantity of light weight tape being offered for sale.

We do not intend to infer that all manufacturers not members of this Association are guilty of intentionally supplying light weight tapes. Many of them manufacture tapes honest in every way. It is a principle of the Gummed Tape Manufacturers' Association, however, that no member shall use any but standard weight papers, and you can be sure of obtaining full weight tapes by ordering from one of the firms listed below.

WE ASK THE COOPERATION OF THE PAPER TRADE IN HELPING US TO DESTROY UNFAIR PRACTISES WHICH IN THE END ARE BOUND TO REACT AGAINST THE PAPER BUSINESS.

GUMMED PAPER MANUFACTURERS' ASSOCIATION
18 EAST 41st STREET, NEW YORK CITY

GPMA
MEMBER OF THE GUMMED PAPER MANUFACTURERS ASSN.

By JACOB ERICHSEN, Sec'y

Members:

The Crowell Corporation, 241 37th St., Brooklyn, N. Y.
The Gummed Products Co., Troy, Ohio.
The Liberty Paper Co., 203 Lafayette St., New York, N. Y.
The Mid States Gummed Paper Co., 2433 S. Robey St., Chicago, Ill.
The Nashua Gummed & Coated Paper Co., Nashua, N. H.

PLYMOUTH CORDAGE
RICHARD BAUER
PAPER
THINK!
PAPER
MORE!
ELECTRO BLEACHING GAS CO
AMERICAN MANUFACTURING CO

"Baker Manufacturing Corporation"

Formerly Baker & Shevlin Co.

Manufacturers of

A General Line of

Paper and Pulp Making Machinery

including:—

Automatic Magazine Grinders (Owners of all U. S. Patents)
Bronze and White Metal Valves for Sulphite Mills
Bronze and White Metal Pipe and Fittings for Sulphite Mills
Centrifugal Screens — Horizontal and Vertical
Centrifugal Pumps
C. Bache Wiig Barking Drum
Cylinder Moulds
Decker Machines or Pulp Thickeners
Feeney Automatic Stock Regulator
Kneaders
Monarch Diaphragm Screens
Paper Making Machines—Cylinder and Fourdrinier
Paper Machine Screens — Horizontal Rotary
Pocket Grinders of most approved type
Pulp Refiners
Ramsey Patent Grinder Valves
Sliver Screens
Wet Machines
Winder Shafts
Worm Washers
Worm Knotters

BAKER MANUFACTURING CORPORATION

Saratoga Springs, N. Y.

were also exhibited. These rolls with the Crandall drive for paper machines are power savers and eliminate gears from driers. A new, simple and effective guiding system was shown in the Ford automatic vacuum felt and wire guide. Among othe specialties of the Sandusky Foundry and Machine Company forming the exhibits were the well-known Millspaugh shower pipes and foam sprays; Millspaugh patent suction slice pipes were also featured. The Wilder header or press for heading rolls of paper attracted attention.

Norma Co. of America

The Norma Company of America, of Long Island City, N. Y., displayed the Hoffmann Precision Products, which have deservedly gained a world-wide reputation. The Hoffmann products include: Precision Roller Bearings, Thrust Bearings, Steel Rollers, Standard Roller Gauges, etc.

University of Maine

The important work of the Pulp and Paper School of the University of Maine was thoroughly demonstrated by the courteous representative in charge of the school's booth, and examples of the high-class work of the students were used to impress on visitors the excellent results of the comprehensive training afforded at that seat of learning.

John Lackner

Different kinds of pastry, soufflé cups and ice cream cups were featured in the booth of the John Lackner Company, of Long Island City, N. Y., manufacturers of paper specialties for hotels, summer resorts, etc. These products are dainty enough to suit the most fastidious and strong enough to stand the strain of constant use.

Richard Bauer

Some useful and unique specialties were displayed by Richard Bauer, of New York, including card stock for high-class lithography, card stock for hand painting, coated pasted specialties, ticket stock in all colors, tissues for novelty manufacturers, wax paper manufacturers and other converting purposes, tissues for consumers, watermarked wrapping papers, textile wrappers, and a full line of wrapping papers.

Individual Drinking Cup Co.

The Individual Drinking Cup Company, Inc., of New York, displayed its regular line of "Dixie" drinking cups, made of paper, as well as vending machinery, dispensing apparatus and soda fountain equipment which this company manufactures in connection with "Dixie" cups. The Dixie Corporal Dispenser is compact, perfect in operation and attractive in appearance—the metal part is nickel plated and the tube is clear flint glass. A small individual cup holder, the Dixie Corporal Holder, is recommended for soda fountains, physicians and dentists.

Forest Paper Co.

A general paper display, featuring bonds, ledgers, cover papers and bristols, was presented by the Forest Paper Company, Inc., of New York, known as "The House of Standard Grades." The booth was very tastefully decorated and attracted wide attention.

Pennsylvania Salt Mfg. Co.

The Pennsylvania Salt Manufacturing Company, of Philadelphia, exhibited an interesting and instructive chemical display which included all grades of paper makers' alum, bleaching powder, liquid chlorine and muriatic acid manufactured by this concern.

Nash Engineering Co.

One of the most notable exhibits of the show was that of the Nash Engineering Company, of South Norwalk, Conn., which included the Jennings Dryer Exhaust Unit and the New Type Jennings Flat Box Unit, shown for the first time at the Paper Exposition. The various pumps and compressors for air and gas manufactured by this concern were shown in actual operation. The workmanship on these pumps is unsurpassed. The limit system of manufacture is used, with Johansen measuring blocks as a reference. Interchangeability of all parts is assured and inspection is very rigid.

Dorr Company

Of particular interest to the paper trade was a small five-foot Tray Thickener shown by the Dorr Company, operating as a "save all" on white paper, which is claimed to recover in most cases about 90 per cent of the fiber in the feed. It also operates continuously and automatically with small power requirements. Smaller models of the Dorr Tray Thickener, the Dorr Agitator and the Dorr Classifier were also shown. These machines find their application to the paper industry in the clarification of bleach liquors, the settlement of caustic muds and the removal of grit from milk of lime.

Taylor-Wharton Iron & Steel Co.

Material for use in paper mills was displayed by the Taylor-Wharton Iron and Steel Company, of High Bridge, N. J., including "Tisco" manganese steel one-piece beater roll and "Tisco" manganese steel one-piece Jordan plug and liner, manganese steel chains and miscellaneous castings. Due to the nature of "Tisco" manganese steel, the bars wear a long time and they cannot tear out and will not break. The Taylor-Wharton Iron and Steel Company claim to be the oldest producers of manganese steel in America.

J. O. Ross Engineering Corp.

The J. O. Ross Engineering Corporation, of New York, and the Ross Engineering Corporation, of Canada, Ltd., demonstrated their well-known vapor absorption system and also exhibited the Briner Vapor Economizer. This instructive display attracted many visitors and created great interest, especially among the representatives of the paper and pulp industries.

American Manufacturing Co.

The background of the booth of the American Manufacturing Company, of Brooklyn, N. Y., was a large colored scene portraying the Brooklyn mills of the company viewed from the waterfront. This huge picture gave visitors to the show some idea of the vast extent of the modern and up-to-date plant and its unrivaled waterfront facilities. The exhibit comprised bundling cordage as used by the paper industry, transmission rope used for the transmission of power in the big paper mills, and the grades of cordage which are of interest to the paper trade, from the finest wrapping twine to the largest and heaviest baling ropes.

William A. Hardy & Sons Co.

The exhibit of Hardy bronze screen plates and other bronze articles by the William A. Hardy & Sons Company, Fitchburg, Mass., was of special interest to pulp and paper men. Other features of this exhibit included acid bronze castings employed in digester equipment, including a newly improved type of blow-off valve made by this company which is proving highly successful. Samples of large miscellaneous composition castings made by the company included a number of fittings, gears, cogs and other supplies required in mills.

Jeffrey Mfg. Co.

Problems of handling costs are constantly confronting mill managers. The Jeffrey Manufacturing Company specializes in all kinds of conveyors and other handling appliances and are equipped to meet all requirements of the pulp and paper industries. Its booth contained numerous conveying appliances and exhibited drawings showing plants conveying the raw material from streams to mill storage dams, or direct to barking machines; stacking and reclaiming the pulpwood from storage, and keeping materials moving inside the mill from one operation to another. Plans showing various types of coal, ash, pulp and chip handling outlays were shown. The Jeffrey pulpwood stacker is built on large lines for stacking to a height of ninety feet when so required. The boom swivels through

BECKER PAPER CORPORATION

350 MADISON AVENUE
NEW YORK

Branch Office for New England: 317 Main Street, Springfield, Mass.

EXCLUSIVE DISTRIBUTORS FOR

Westfield River Paper Co.

RUSSELL, MASS.

GLASSINE PAPERS

Plain and Embossed

DISTRIBUTORS FOR

Bedford Pulp and Paper Co.

BIG ISLAND, VA.

Water Finished Sulphite Fibre—Butchers Fibre—Novel News—Hanging

Also

Bond and Kraft Papers

HAMMERMILL
BOND
HAMMERMILL PAPER COMPANY ERIE, PA.
HAMMERMILL
BOND

SYMBOL of QUALITY
KALBFLEISCH
CHEMICALS
FOR NEARLY A CENTURY

PAPER MAKER'S CHEMICALS

COMMERCIAL **ALUM** IRON FREE

SILICATE OF SODA—SODA ASH—SALT CAKE

IMPORTED **CASEIN** DOMESTIC

CRYSTAL BORO PHOSPHATE

(A solvent for Casein)

COATING **CHINA CLAY** FILLER

Imported and Domestic

PULP SATIN WHITE

Exclusive Manufacturers of

DRY SATIN WHITE

(Ryan-Seaman Process)

The KALBFLEISCH CORPORATION

200 FIFTH AVENUE NEW YORK, N. Y.

a large arc and is thereby enabled to cover a larger area than is possible when a rigid boom stacker is used. This company exhibited illustrations of its pulp lap shredder, single roll crushers, scraper conveyors and power plant equipment. The large pictures at the back of the booth showing the numerous uses of conveyors and handling machinery in pulp and paper mills indicated the wide field of usefulness which has been found for these valuable automatic carriers.

Japan Paper Co.

Handmade papers collected all over the world showing the uses to which such paper is applied was an attractive feature of the exhibit of the Japan Paper Company. Many very beautiful printed specimens of European handmade papers indicated the wonderful improvements that have been introduced in the manufacture of modern handmade paper. A noteworthy feature of the Oriental handmade papers was the variety and color-intensity of many of them. These are imported for use in book covers, folders and advertising literature and for special art purposes. The specimens shown gave visitors an idea of the unlimited possibilities for the use of these magnificent specimens of the papermaker's art. This company presented visitors with dainty souvenirs in the form of book marks, etc., made from handmade art paper.

Armstrong Machine Works

The Armstrong steam trap, shown in operation by the Armstrong Machine Works, Three Rivers, Mich., drew many visitors to the company's booth. This trap operates by the rise and fall of an inverted submerged bucket. The bucket motion operates the valve. Steam or air entering the trap collects in the bucket. The steam causes the bucket to float and close the valve. Air also floats the bucket, but it escapes through a vent in the top of the bucket and collects in the top of the trap until it escapes during the discharge. Any steam which escapes with the air is condensed by the surrounding cooler water. The trap is always full of water with the exception of the bucket. This trap is as ingenious as it is effective. It has a wide range of usefulness.

The Whiting Corp.

Cranes, lifting attachments, clearance tables, mechanical brakes and crane trolleys were exhibited by plans and drawings in the booth of the Whiting Corporation, Chicago. The cranes and crane equipment comprised electric traveling cranes, bucket-handling cranes, gantry cranes, transfer cranes, handpower cranes, jib cranes, pillar and bracket cranes and other types. The company's experience in the crane business has been extensive and has enabled it to design cranes to meet every requirement of the paper and allied-industries. Electric crane trolleys made by this company are designed to meet all service conditions. Some designs are in standard sizes ranging from 3 to 100 tons lifting capacity.

Swenson Evaporator Co.

Mechanical evaporators perform many valuable services in pulp mills in reclaiming sulphite and other waste. The Swenson evaporator is designed to deal with any liquor in any capacity. The concentration of dilute solutions in multiple effect evaporators affords the most economical means for recovering matter from solutions. Waste products are converted into by-products by means of evaporators. Swenson evaporators are built in sizes ranging from 100 to 20,000 gallons per hour evaporation. Standard types have been developed from many years experience and are made to meet most requirements. Special types are designed when conditions require. The horizontal tube type of evaporator is the most widely used. It is of rectangular shape with horizontal tubes located near the bottom of each effect. It is made up in sections of heavy cast iron plates with machined and drilled faces and flanges. The assembled castings are bolted together with suitable packing material (usually sheet asbestos) making a vacuum tight joint. There is a steam chest at each end cast as an integral part of the vertical tube sheets. Each tube passes through both tube sheets and is packed by Swenson packing plates and rubber gaskets. This scheme of packing has proved a source of satisfaction to customers. It combines vacuum tightness and resistance to high temperature with great ease of removal. One of the most important features of the Standard Swenson is the readiness with which transportation and erection can be effected. This type of evaporator requires small headroom (in most cases only 12 feet) and as it is shipped in sections, can be taken into a building through an ordinary door.

Gurney Ball Bearing Co.

A complete line of ball bearings driven electrically and representing the name of Gurney was shown by the Gurney Ball Bearing Company. Another highly attractive feature of this company's exhibit was a ball bearing of extraordinary size revolving and turning at the one time. The company manufactures a standard line of bearings and meets the special requirements of engineers' specifications.

Ryther & Pringle Co.

Drawings exhibiting Wolf coolers were shown by the Ryther & Pringle Company. This type of cooler is successfully used in the reclamation of relief gases from the digesters in the manufacture of chemical fibers. It consists of a series of small hard lead pipes and is installed between the digester and recovery tank. The lead pipes are contained in a cast iron case with planed and bolted joints, packed with sheet rubber and provided with suitable openings for the circulation of the cooling water. This cooler has an exceptionally high conductivity capacity which makes it suitable for the requirements of pulp and paper mills. "Arpeko" pulp machinery was also shown by the Ryther & Pringle Company. The "Arpeko" chip screen is of a new design. It has two tables, the lower one carrying a double screen. This screen is equipped with Timpkins bearings and is operated by an eccentric motion. The "Arpeko" pulp shredder is designed to handle dry and frozen pulp. It is being installed in many new mills. The "Arpeko" slashers handle logs up to a length of 16 feet and reduce them to any required length. It is a well-proved pulp mill appliance.

Beloit Iron Works

An attraction in the booth of the Beloit Iron Works was a large roll of news print which was made at the record speed of 1,100 feet per minute. This company's paper making machines are well established and widely used. The newest machines embody the latest improvements.

Union Sulphur Co.

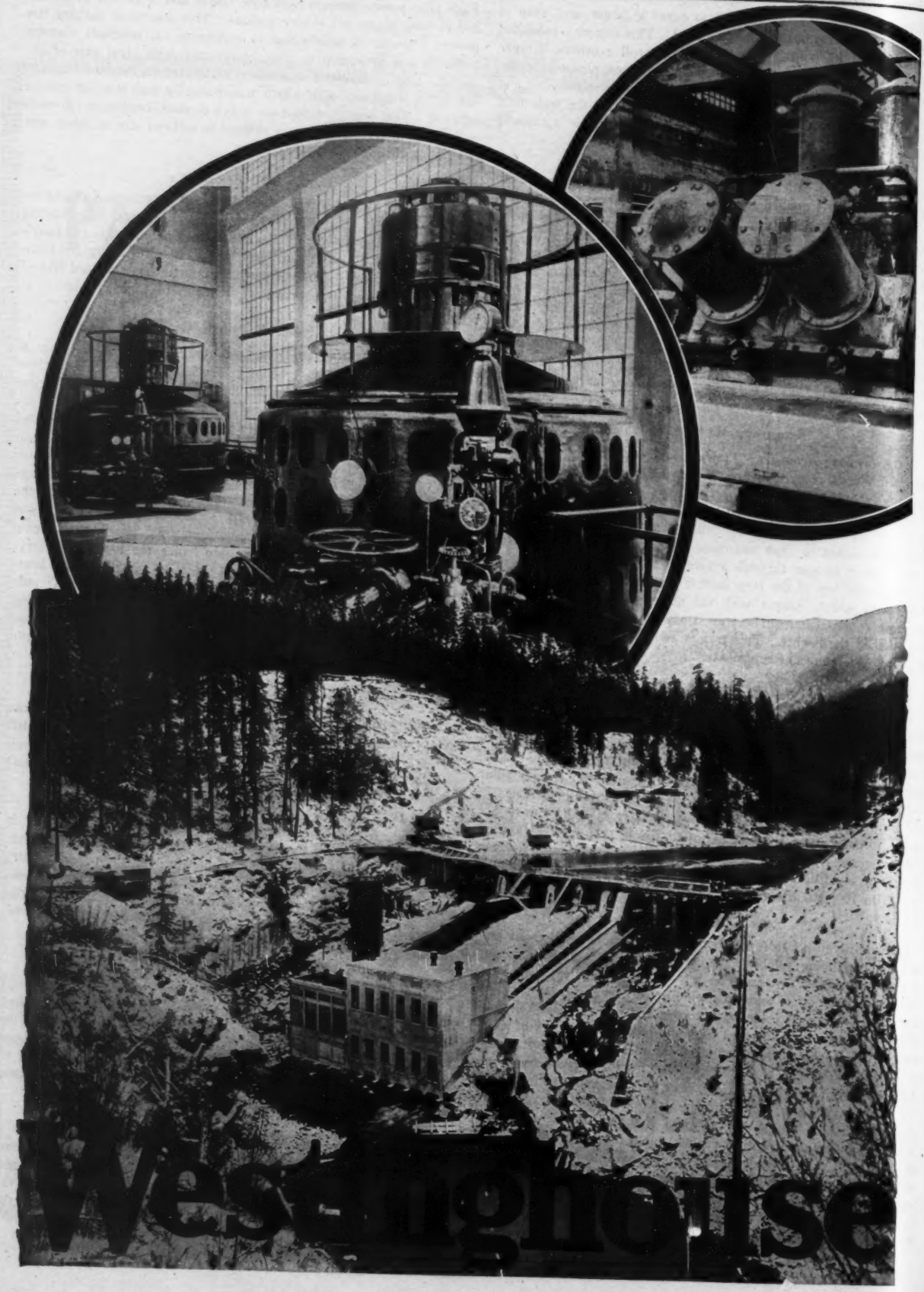
Sulphur, one of the comparatively few chemicals employed in ancient industries, is today an article of widespread use in commerce. Immense quantities of sulphur are consumed by the paper industry in the manufacture of pulp from wood. The Union Sulphur Company had no display but had an attractive booth which it provided so that its friends in the paper industries could meet its representatives and receive friends.

Forest Service of U. S. A.

An interesting and instructive exhibit was provided by the Forest Service of the United States Department of Agriculture. A colored chart was used to show the present pulpwood situation in the United States and to explain how consumption has outstripped production in the last decade. Large colored panels were used to describe the remarkable possibilities of Alaska and to show how that territory can supply one-third of our pulp-wood needs.

Keystone Lubricating Co.

A drawing feature of the booth of the Keystone Lubricating Company was the "strong man contest." The idea of this was to test the muscular strength of visitors who were enabled to turn the wheel of a Keystone manifold safety lubricator and so record the


Westinghouse

pressure of their exertion on a gauge attached to the machine. Many prominent paper men entered the contest. Some of those who made unusual records were F. E. Ericson, Noel Statham, S. I. Anderson, O. B. Brown, G. H. Gleason and William R. Maule. Their Records varied 350 to 590 pounds. These tests caused much excitement among visitors, who cheered the prize-winners. This company also featured its various densities of Keystone "Keyso" high melting point grease. The density characteristics of this effective grease are practically unchanged by variations in temperature within the usual working conditions.

International Exposition Co.

The International Exposition Company showed in its booth a large number of articles made from paper pulp or partly from pulp. These were a popular as well as an instructive feature of the exhibition. Among articles shown were numerous fabrics, laces and twines made from vegetable fibers, hard rods, cylinders and pipes suited to many uses. These indicated the opportunities open for the further use of pulp. A large rug made entirely of paper, which resembled a fine Oriental matting rug, astonished visitors by its novelty and beauty. Rugs of this character have been on the market several years and have earned a good reputation for service and usefulness.

Cooper & Cooper, Inc.

Saltcake by-product and natural, and paper chemicals, were displayed at the booth of Cooper & Cooper, Inc., of New York. For a number of years Cooper & Cooper have been regarded as the headquarters for saltcake, controlling the production of the natural material, as well as by-product saltcake, at a number of conveniently located shipping points throughout the United States and Canada. Through their branch organizations at London and Hamburg, Cooper & Cooper are in control of foreign saltcake sources, the material being available for distribution among kraft mills located within a radius of 500 miles from Atlantic and Pacific ports. Cooper & Cooper also are importers of the following paper chemicals: Sulphate of aluminum, iron free and technical, china clay, chloride of lime, alum, blanc fixe, lead acetate, magnesite and bisulphite of soda.

Paper Machine Wire Manufacturers' Council

Two adjoining booths were engaged by the Paper Machine Wire Manufacturers' Council and furnished and decorated as reception rooms for the use of visitors to the Paper Exposition. The concerns responsible for this thoughtful arrangement were: The Buchanan and Bolt Wire Company, the William Cabble Excelsior Wire Manufacturing Company, the Cheney Bigelow Wire Works, the Eastwood Wire Manufacturing Company, the Lindsay Weaving Company, the Joseph O'Neill Wire Works, the W. S. Tyler Company, and the Wisconsin Wire Works.

Technical Association of the Pulp and Paper Industry

Another attractive booth for the use of visitors to the exposition was provided through the courtesy of the Technical Association of the Pulp and Paper Industry, which organization did so much to ensure the success of the Big Show.

Oliver Continuous Filter Co.

At the booth of the Oliver Continuous Filter Company, of San Francisco and New York, an Oliver filter was operated to demonstrate the efficiency of the method and the economies it effects. Data for pulp mills was available for pulp mill engineers and operators regarding: Oliver continuous filters for brown stock washing in both soda and sulphate pulp mills; thickening pulp before bleaching; save-all work, and de-watering and washing lime wood in soda and sulphate mills.

Layne-New York Co.

A water tank with a glass front set in an ingenious reproduction of a garden, was used in the exhibit of the Layne-New York Company of New York, to show a cross section of a Layne gravel filter well, such as is installed in ground water formation. The well was equipped with a small working model of the Layne turbine pump set at the bottom of the well and directly connected to a model D. C. vertical motor. The pump lifts the water from the well into a surface reservoir from which the water is recirculated. Through the glass front the water could be seen flowing through the different water-bearing strata and the gravel filter and then into the well. This type of well is employed to secure a large quantity of ground water for use in paper manufacturing.

Frederick Iron & Steel Co.

The Frederick Iron and Steel Company, of Frederick, Md., and the Dominion Engineering Works, Ltd., of Montreal, Canada, sole manufacturer and representative of the Frederick products in Canada, co-operated in displaying the various Frederick products, including the Frederick Single Suction, Heavy Duty Centrifugal Pumps, which have been developed and placed upon the market to supply the insistent demand for high grade pumps for pulp and paper mills; the Frederick Surex Vacuum Pumps for high or low vacuum, which show an exceptionally high efficiency under any conditions within the limits of two inches to twenty-five inches of mercury; and the Frederick Ash Handling Apparatus.

Bird Machine Co.

The Bird Machine Company, of South Walpole, Mass., with its exclusive representative in Canada, the Canadian Ingersoll-Rand Company, presented a joint exhibit. Actual full-size items of special paper mill machinery were on view in the space occupied by the Bird Machine Company. These included a Bird rotary screen, a Bird save-all and a Bird self-cleaning shower pipe. The last named was shown in operation just as it is seen in paper mill work, thus affording a convincing demonstration of its value. The technical men connected with paper mills found a good deal to hold their attention at the Bird Machine Company booth. Being familiar with the operation of these forms of mill apparatus the paper mill men could readily visualize their workings from what they were.

Ingersoll-Rand Co.

Photographic illustrations were provided by the Canadian Ingersoll-Rand Company, Ltd., showing the full line of pulp and paper machinery which it manufactures, including the Ryther Parallel Endless Chain Log Hauls, Ryther Single and Multiple Saw Slashers, Circo Chippers and Chip Crushers, Ryther Patent Relief Drive Balanced Reciprocating Chip Screens, Paulson Patent Barking and Washing Drums, Paulson Patent Bark Press, Circo Improved Three Pocket Pulp Grinders and Cameron Steam and Centrifugal Pumps.

Enterprise Machine Co.

The Enterprise Machine Company, of Middletown, Ohio, gave a demonstration of the various types of gate valves manufactured by this concern. Perhaps the feature of the booth was the display of the Brooks Patented Quick-Opening Gate Valve, the working of which aroused great interest and attracted many visitors.

W. E. Shuttleworth & Co.

The various grades and types of folding paper boxes manufactured by W. E. Shuttleworth & Co., New York, were attractively and artistically displayed. An unique souvenir was presented by this firm to visitors to the Paper Show in the form of a paper bank on which was printed the slogan, "Save your money by buying of us."

Booth Chemical Co.

The recovery process which employs coagulation to white water from paper machines and saves pulp for immediate use known as the Boothal coagulation process was exhibited by the Booth Chemical Company. Fine pulp and clay and other loading materials carried by the white water are coagulated and caused to settle in a shorter time than usual by the sedimentation process. The company ap-

SCANDINAVIAN PULP AGENCY, Inc.

50 East 42nd Street ~ New York City

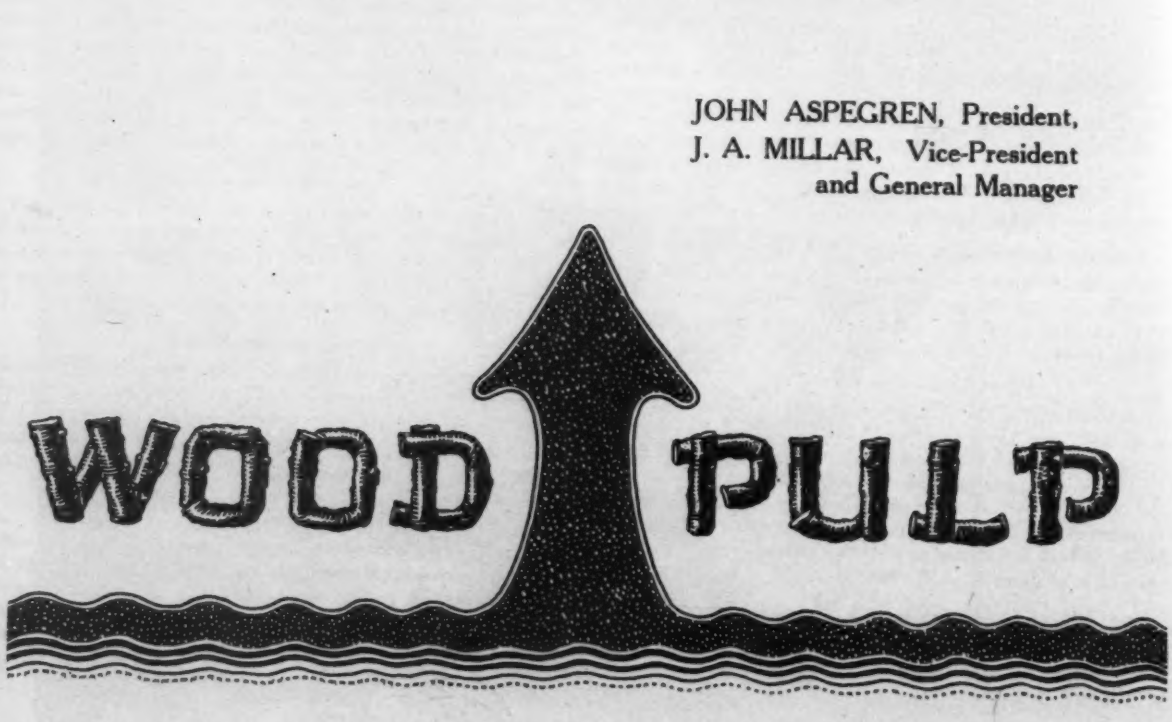
Announcement

Beginning April 2, 1923, this Company will engage in the business of selling WOOD PULP, and will handle as agents the following brands:

Uddeholm Kraft and Sulphite
Stora Kraft and Sulphite
Wifsta Warf Kraft and Sulphite
Lion Brand Kraft
Utansjo Sulphite

Inquiries are solicited and will receive prompt and proper attention.

JOHN ASPEGREN, President,
J. A. MILLAR, Vice-President
and General Manager



plies the Boothal process to the removal of color and suspended matters. The practical demonstration of a Boothdry feeding machine which is used for feeding dry chemicals and other powdered matter in pulp and paper mills was an interesting feature of the company's exhibit.

Williams Apparatus Co.

The Williams Apparatus Company, of Watertown, N. Y., demonstrated the value to the trade of the Williams Standard Pump Testing Outfit. This company also displayed the Williams Standard Paper Moisture Tester, a compact apparatus which gives quickly the exact moisture of the content of the paper as it comes off the machine. Other features of the exhibit were the Williams Standard Freeness Testing Outfit, the Williams Improved Strainer Bowl and the Williams Improved Electric Centrifugal Extractor with electric heating and drying device.

Paper Makers' Chemical Co.

The Paper Makers' Chemical Company, of Easton, Pa., in collaboration with the Western Paper Makers Chemical Company, of Kalamazoo, Mich., demonstrated the manufacture of rosin size from the time the pine trees are tapped until the resinate of soda is ready to go into the manufacture of paper. The exhibit was illustrated by working models which included rosin still, rosin size system, foam killer and raw materials used in size manufacture.

Plymouth Cordage Co.

Manila rope, transmission rope, papermakers' twines and other products manufactured by the Plymouth Cordage Company, of North Plymouth, Mass., excited the interest of visitors to the show. In a well-designed rope drive the most trouble will come in the stretch of the rope. The transmission rope manufactured by the Plymouth Cordage Company, however, has the stretch as much eliminated as is possible to manufacture it.

Hermann Paper Co.

The Hermann Paper Company, Inc., of New York, N. Y., gave a general display of the lines of paper and bonds handled by this concern. A feature of the exhibit was the demonstration of the different scales manufactured by the company, including a general paper scale, tissue paper scale, stationary reduction scale, box board scale, board reduction scale, light weight board scale and automatic micrometer guage.

Feculose Co. of America

A comprehensive display of "Feculose" products and "Reliance" oilless bushings were the striking features of the exhibit of the Feculose Company of America. Feculose is a starch acetate somewhat similar in nature to cellulose acetate, and is manufactured under a patent. Although intended principally for the sizing of offset papers it can be used for a wide range of papers, including writings. No other application except the heat of dryers is necessary with the use of Feculose.

The Bristol Co.

The Bristol Company, of Waterbury, Conn., exhibited its various lines of recording instruments for paper and pulp mills. Chart records from Bristol Recorders settle disputes, induce uniform operating conditions, promote safety and fire protection, and inspire operators to do good work.

C. K. Williams & Co.

Pulverized dry colors such as are used by paper manufacturers were shown by C. K. Williams & Co., of Easton, Pa. Specimens of various crude materials from which these colors are manufactured were also exhibited, a great many visitors showing great interest in the appearance of the crudes. Fillers for papers were shown. These are used in the same manner as clay and are said to have a better retention. Crudes for which the fillers are manufactured formed a part of the exhibit.

Paper Makers' Importing Co.

The exhibit of the Paper Makers' Importing Company, Inc., consisted of English and domestic clays in their various stages of manufacture, as well as samples of the finished product. China clay as used in paper making was also demonstrated.

American Paper Forming Co.

Paper pie plates, ice cream plates and white picnic and lunch plates were shown in various sizes, grades and designs by the American Paper Forming Company.

Purity Vessel Co.

The Purity Paper Vessels Company exhibited its extensive line of Purity paper cans, "Pavesco" paper milk bottles and ice cream containers. The paper milk bottles shown by this company attracted keen attention from visitors who were interested in the packing of dairy products.

Searlright Company

Milk and ice cream containers and pouring pull milk bottle caps were shown by the Sealright Company, maker of "Fulton" board food product containers. An attractive display of paper butter tub containers made by this company also was shown.

Continental Paper & Bag Mills

The numerous paper products manufactured by the Continental Paper and Bag Mills made an imposing display. The glassine bags, coffee bags, laundry bags, counter envelopes made by this company, together with other specialties which included fuel meal and other sacks were favorably commented upon. Many visitors were interested in this company's unique and widely known egg cartons, its toilet paper display. The miniature sample rolls of Green Bond Fiber were in great demand as souvenirs of the Exposition.

A. W. Archer Co.

The Shuford Mills displayed a wide line of cotton wrapping, sash cords and braided cotton clothes line. The Oakdale Cotton Mills exhibited high grade colored Sea Island twines. The exhibits of these mills were made by A. W. Archer Company, the New York selling agent.

Westfield River Paper Co.

"Paperglas," the glassine paper manufactured by the Westfield River Paper Company which is extensively used for wrapping cigarettes, candies, linen collars, advertising envelopes, grease-proof wrappers, fruit wrappers and for many other purposes indicated the extensive commercial applications which are now made of this valuable type of paper. Samples of this paper in stamped and embossed forms showed the possibilities of its use in art work.

Kalbfleisch Corp.

Samples of the chemicals employed in the paper trades and allied industries were attractively displayed by the Kalbfleisch Corporation. Paper men expressed interest in this corporations line of china clays both domestic and English which were exhibited. The dry satin white, one of the newly developed preparations used in the coating industry, also elicited favorable comment. Other features of this exhibit included bleaches, salt cake, and different grades of sulphate of alumina and casein.

J. P. Lewis Co. Inc.

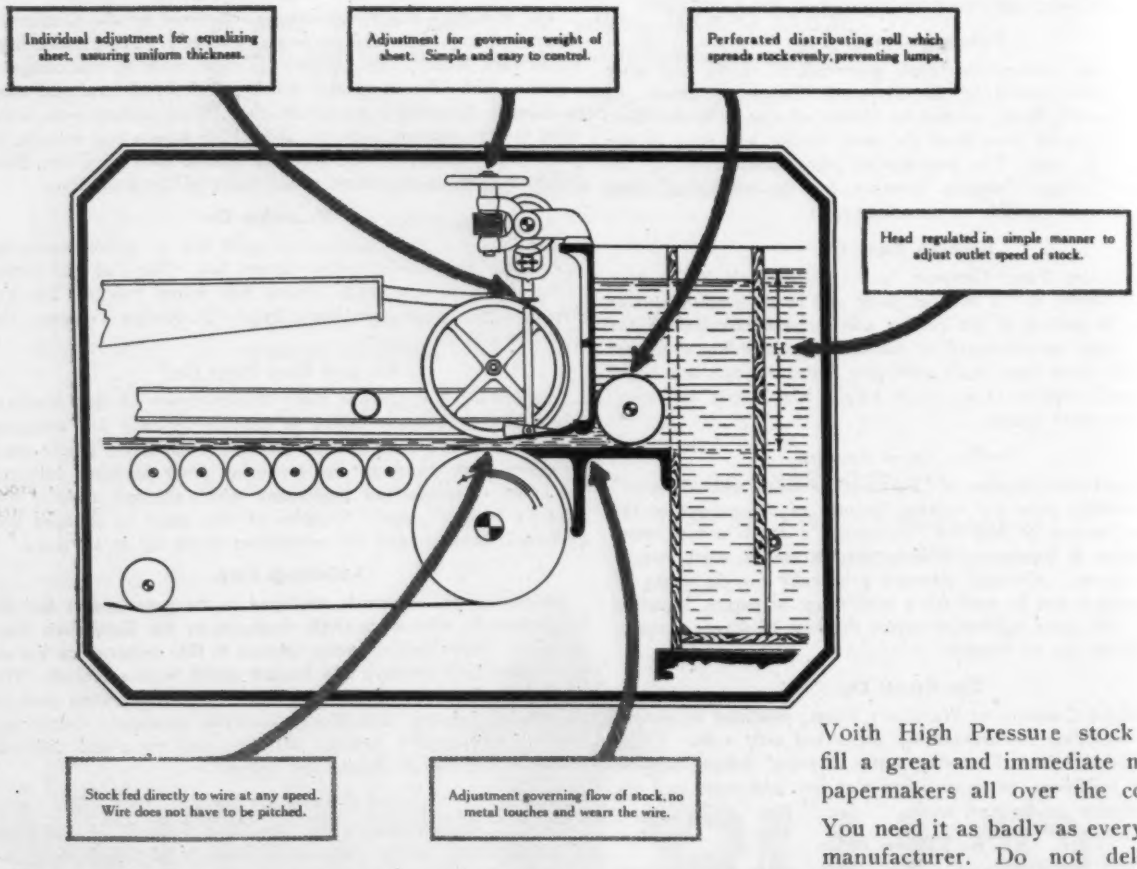
The J. P. Lewis Company, Inc., of Beaver Falls, N. Y., exhibited in an attractive manner the various products of this concern, including patent coated white boards, patent coated white manila boards, anti-tarnish white lined pulp board, white lined wood blanks, filled and solid manila boards manila lined pulp boards, solid and filled wood pulp boards, solid jute fiber jacquard and box boards, index bristols, cream post card, cover papers, special card boards, etc.

United States Testing Co.

At the booth of the United States Testing Company, Inc., of

Stop Pitching *the* Wire

It is Unnecessary *if* You *use a*


Individual adjustment for equalizing sheet, assuring uniform thickness.
Adjustment for governing weight of sheet. Simple and easy to control.
Perforated distributing roll which spreads stock evenly, preventing lumps.
Head regulated in simple manner to adjust outlet speed of stock.
Stock fed directly to wire at any speed. Wire does not have to be pitched.
Adjustment governing flow of stock, no metal touches and wears the wire.

Voith High Pressure stock inlets fill a great and immediate need of papermakers all over the country.

You need it as badly as every other manufacturer. Do not delay. A letter or post card will bring you immediately all particulars regarding this new invention.

Write immediately for full information.

New York, N. Y., a corps of workers were kept busy answering questions in regard to the chemical, microscopical and physical examinations carried on in the laboratories of the company. At an official testing laboratory of the American Paper and Pulp Association, the corporation tests paper and paper products for both the manufacturer and the consumer.

American Writing Paper Co.

The American Writing Paper Company of Holyoke, Mass., exhibited a full line of the various kinds and grades of papers which make up the Eagle-A Quality Standards. A huge composite picture of the twenty-six mills operated by the company was flanked on either side by panels showing, on the one hand, some of the new portfolios issued by the company to illustrate the various printing and stationery uses to which Eagle-A papers are put; and on the other, a set of portfolios indicating how Eagle-A papers are employed in converted forms.

W. & M. Talcott

A pliable belt fastener which draws the edges of belts together and combining the strength of metal with the pliability of leather is a valuable article for any mill. Fasteners made by W. & M. Talcott, Inc., Providence, R. I., embody such features and their booth was visited by most of the mill men of the exposition who showed great interest in the numerous types of fasteners exhibited and the numerous ingenious kinks employed to overcome difficult fastening problems. This firm showed fasteners suited to all classes of belts and exhibited several fasteners of new design which possess novel improvements.

Carthage Machine Co.

An interesting attraction shown by the Carthage Machine Company was the Carthage pulp and paper shredder, a new and highly effective machine for wet, dry or frozen sulphite and ground wood laps, sheet and kraft pulp, paper and magazine stock. All these materials are handled efficiently and economically with a great saving in time, power and up-keep. A machine was exhibited set for operation with samples of the various materials it handles. Standard and digester blow valves and other fittings were also shown and drawings were exhibited illustrating many other appliances and machines for paper makers, including the Carthage wet machine, wood pulp grinder, chip screen, chipper and pumps. A large, prominently displayed picture at the back of this company's booth showed a complete line of goods it manufactures and view of its plant.

Duriron Co.

Acid-resisting pumps, pipes, valves and other working parts made of high silicon alloys were shown by the Duriron Company. It is a well known alloy which shows a white fracture and takes a high polish, resembling nickel. Its hardness is such that it is finished by grinding instead of milling. It resists oxidation even at the highest temperatures. Its resistance to corrosive and erosive action is pronounced and these qualities have induced the manufacturers to describe it as a universal acid resistant. It is also perfectly resistant to alum and chlorine solutions and is successfully employed in paper mills handling such chemicals.

Lead Lined Iron Pipe Co.

The Lead Lined Iron Pipe Company exhibited a varied line of lead lined iron pipe, valves, bearings, flange fittings, angle valves and other acid and chemical resistant articles suited to the requirements of the pulp and paper trades. This resistant system is also valuable where acid waters are dealt with in boiler feeds. The piping made by this company is galvanized by a special process before the lead lining is fused into the iron pipe. Sections show that a solid pipe without any possibility of the separation of the metals results from the process employed in the manufacture of these goods. The combined strength of the metals raises the tensile strength of the pipes. This pipe is cut out of wrought or cast iron, spiral riveted pipe with flanged or screwed joints as required by the specifications of mill men.

CHANGES IN HANNA PAPER CORP.

Some very important changes in the management of the Hanna Paper Corporation business now owned by the St. Regis Paper Company, becoming effective at once, were announced officially at the local offices of the company Saturday. With the resignation of several prominent officials it means substantially the complete transfer of the active management of the Hanna mills to the hands of the St. Regis Paper Company organization. A policy of reducing the overhead and increasing production is said to be back of the important changes.

Joseph Krockenberger, former superintendent of the Deferiet plant of the St. Regis Paper Company, went Tuesday to Norfolk to become general superintendent of the Hanna mills at Norwood, Norfolk and Raymondville, succeeding William Christopher who has been there for four years and who was superintendent of the Raymondville mill for two years previous.

Karl F. McGrann, office manager at Deferiet, will go to Norfolk within a few days to become assistant to Mr. Krockenberger.

Franklyn P. Wadley, puchasing agent for the Hanna Paper Corporation for several years, has tendered his resignation and terminated his services Saturday night. He will devote himself to the duties of purchasing agent for the Champion Paper Company of Carthage, still owned and operated by the Hanna interests. It is understood that his duties will be taken over by Leo W. Bowker, assistant purchasing agent, and that no one will be appointed to the vacancy.

Report has it that Paul R. Hotchkins, assistant secretary, is also to withdraw from the organization, but this report was not confirmed by Mr. Hotchkins.

According to Carl B. Martin, secretary of the St. Regis Paper Company, and C. T. Jewell, assistant general manager of the company, it is planned to install the production methods in operation at Deferiet in the Hanna mills. It is believed that with the system similar to that at Deferiet the output of the mills will at least approximate the daily averages at the St. Regis plant.

Joseph Krockenberger is a paper mill man of life long experience and with a high reputation as a superintendent. He was formerly in the Donnaconna mills in Canada, then in the DeGrasse Paper Company mill at Pyrites and from there became superintendent of the Deferiet mill three years ago.

BERKSHIRE COST ASSOCIATION MEETS

A very interesting meeting of the Berkshire Local Division was held at the Hotel Richmond, North Adams, Mass., March 27, 1923. Previous to the meeting the members were invited to inspect the mill of the Berkshire Hills Paper Company, located at Adams. A majority of those attending the meeting availed themselves of this opportunity.

The meeting was called to order at 3:15 by the president, and after a short business meeting was turned over to H. D. Shaw, who then explained the workings of the cost system in use by the Berkshire Hills Paper Company. Mr. Shaw's remarks were supplemented with exhibits of the various forms used by his company. After Mr. Shaw's address a general discussion was held.

Dinner was served at 6 o'clock, after which the meeting was addressed by Judge F. R. Shaw, president, and H. L. Harrington, treasurer of the Berkshire Hills Paper Company. who praised the work that was being done by the local. G. S. Gordon, first president of the local, also was called upon for some remarks, and responded fittingly.

The meeting was attended by representatives of mills from Troy, N. Y.; Lee, Adams and Dalton, Mass.

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COHOES, N. Y. — **WATERFORD, N. Y.**

HANGING, LINING, NOVEL, WAXING — RAWSTOCK FOR COATING
COLORED SPECIALTIES

Northwest Paper Co. Makes Big Improvements

New Buildings Are Practically Completed and Installation of Machinery and Equipment Will Proceed as Rapidly as Possible With the Probability of Starting the New Units in Operation Some Time During the Summer—Equipment Is of the Most Modern Type and Will Enable the Mill at Cloquet to Manufacture Variety of High Grade Products—G. F. Hardy, Engineer of New York, in Charge.

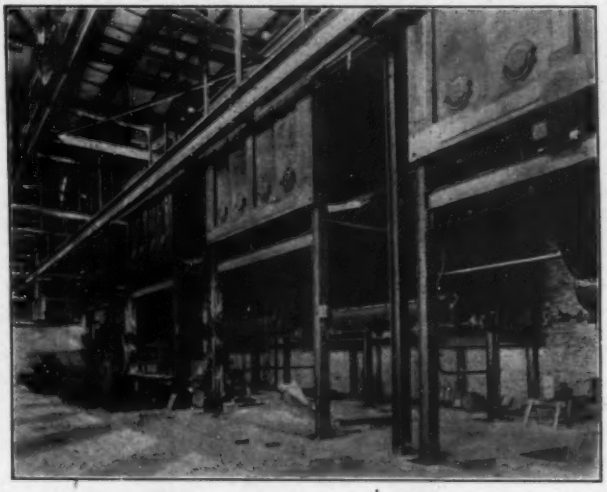
Written Especially for the Annual Number of the Paper Trade Journal

The Northwest Paper Company has been making extensive improvements to its plant at Cloquet, Minn., during the past five years.

The new developments include a chemical pulp unit of 60 tons' capacity, a new 4,000 h. p. boiler plant to replace older equipment developing 1,900 h. p., and to provide increased demands for steam for the new chemical pulp mill and for additional steam turbine.

In connection with these developments, a new finishing room has also been built, and one of the paper machines has undergone extensive alterations.

Work on the new buildings started during the month of June, 1922, under the supervision of George F. Hardy, as architect and engineer.



INTERIOR VIEW IN NEW BOILER ROOM

Contractors for the work are Siems, Helmers & Schaffner, of St. Paul, Minnesota.

At the present time, the buildings are practically completed and installation of machinery and equipment will proceed as rapidly as possible with the probability of starting of the new units some time during the summer.

The chemical pulp unit consists of a wood preparing room 95 feet x 110 feet, equipped with a Manitowoc Barking Drum, 12 feet x 14 feet, and an 84-inch Carthage chipper.

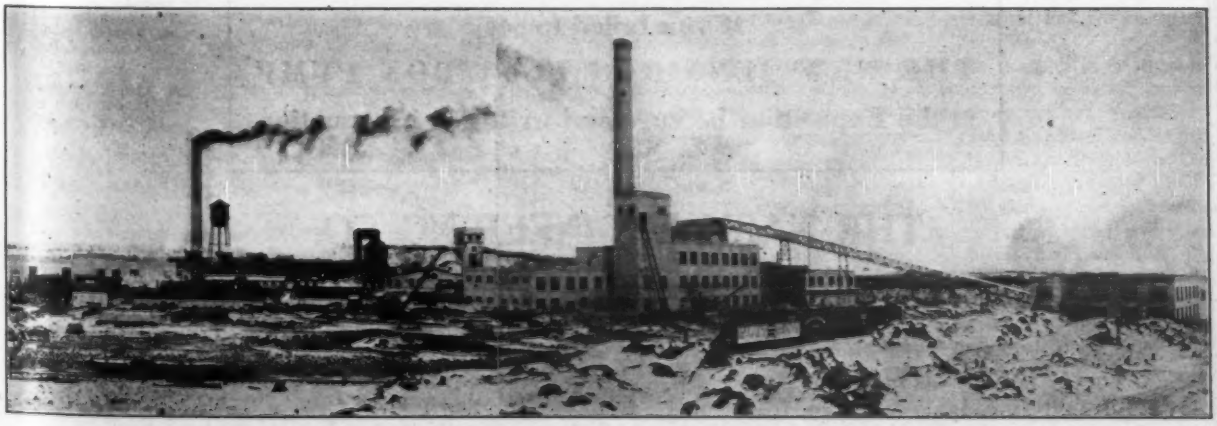
The chip tank, digester house, recovery room, bleach plant, screenings and wet rooms, are housed in a building 440 feet long, with an average width of 80 feet, the type of construction throughout being structural steel with brick panels, steel sash, and gypsum roofs. The digesters were built by M. W. Kellogg Company; the evaporators by E. B. Badger & Sons Company; the tanks and breeching by Williams Bros. Boiler and Manufacturing Company, and a Wolf bleaching system is to be installed.

The boiler plant and turbine room are housed in a building 165 feet long, with an average width of 60 feet, and contains four 834 h. p. Babcock & Wilcox sterling boilers, with integral economizers and Detroit stokers.

The coal handling apparatus is furnished by the R. H. Beaumont Company, and the ash handling devices by Allen-Sherman-Hoff Company.

A boiler setting work is now in progress, under the direction of Michael Liptak, of Minneapolis.

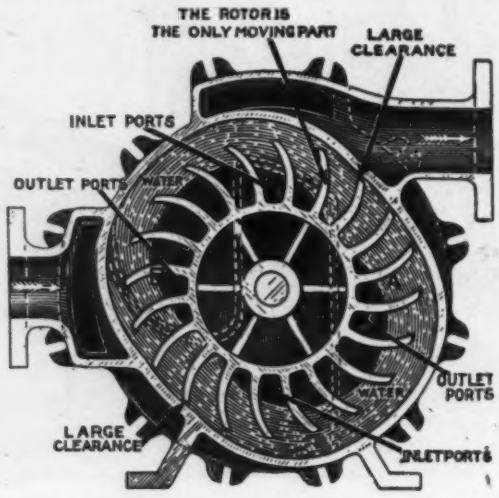
The plant is equipped with a radial brick stack, 14 feet in diameter, and 250 feet high, built by the Alphons-Custodis Chimney



IMPROVEMENTS AT THE PLANT OF THE NORTHWEST PAPER CO., CLOQUET, MINN.

THE HYTOR VACUUM PUMP

FOR FLAT BOX SERVICE



Vacuum Produced Absolutely Without Pulsation
No Vibration Saves Wires
Only One Moving Part
No Rods, Pistons, Crank Shafts, Loose Moving Parts and No Gears
No Expert Attendance

If you failed to see
THE NEW JENNINGS FLAT BOX PUMP
at the Exposition be sure and write for information

THE NASH ENGINEERING CO.

WILSON POINT ROAD
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Construction Co., and said to be the highest stack in the State of Minnesota.

The turbine room will contain a 1,500 k. w. steam turbo-generator furnished by the Westinghouse Electric and Manufacturing Company, with a possibility of a 2,500 k.w. unit being added in the near future.

The new finishing room, 100 feet x 185 feet, replacing the old finishing room, has already been occupied. Additional equipment to be installed includes a supercalender furnished by the Holyoke Machine Company and a sheet cutter furnished by Moore & White.

The basement of the finishing room contains a new and modern store room, and in addition, the water filtering plant furnished by Norwood Engineering Company.

A new pump house is also to be built to furnish the water supply of the entire plant, and the equipment for this department, as well as the pumps for all of the new units, are to be supplied by the A. S. Cameron Steam Pump Works.

The new unts of the Cloquet mill are furnished with thoroughly modern equipment, which will enable the company to manufacture a variety of high grade products.

INTERNATIONAL PAPER CO. SHOWS BIG LOSS

The International Paper Company has issued its report for the year ended December 31, 1923, showing net loss of $7,572,390, after charges, depreciation and inventory adjustment. This compares with net loss of $7,442,890 in the previous year.

Consolidated income and profit and loss account for the year 1922, compares as follows:

	1922	1921	1920	1919
Operating loss	$1,047,128	*$1,542,642	*$21,936,236	*$7,833,274
Depreciation	2,715,726	2,379,967	2,267,713	2,238,433
Inventory adj.	2,846,691	2,276,607	.....	.....
Federal tax, etc	.....	.....	7,265,280	908,166
Bond interest, etc	962,845	328,958	347,340	367,380
Net loss	$7,572,390	$7,442,890	*$12,055,903	*$4,319,295
Preferred dividends	1,500,000	1,500,000	1,500,000	1,500,000
Deficit	$9,072,390	$8,942,890	†$10,555,903	†$2,819,295
Previous surplus	23,875,180	32,818,070	22,262,167	19,442,872
Profit and loss surplus	14,802,790	23,875,180	32,818,070	22,262,167

*Income. †Surplus.

Consolidated general balance sheet of the International Paper Company and subsidiary companies as of December 31, 1922, compares as follows:

ASSETS

	1922	1921	1920	1919
Plant and property	$57,198,681	$53,643,665	$47,729,477	$43,326,136
Woodlands	7,829,635	8,487,773	9,333,796	7,588,739
Securities	3,600,906	3,609,429	3,647,443	4,088,716
Cash	1,787,328	1,137,399	2,057,932	2,740,832
Notes received	401,043	256,243	913,169	434,465
Accounts received	6,821,834	3,082,307	8,865,179	5,808,277
*Inventory	20,763,306	30,782,154	25,311,515	23,199,327
Sinking fund	51,486	51,140	53,002	131,710
Deferred assets	2,794,958	819,881	479,438	466,716
Total	$101,249,177	$101,869,991	$98,390,951	$87,784,918

LIABILITIES

Preferred stock	$24,910,204	$24,889,288	$24,825,308	$24,771,240
Common stock	19,923,032	19,905,104	19,850,264	19,803,920
Funded debt	19,383,500	7,171,000	6,651,500	6,981,500
Accounts payable	2,082,755	2,546,611	1,653,048	1,426,159
Notes payable	12,623,132	16,039,578	1,595,918	8,600,000
Dividend	375,000	375,000	375,000	375,000
Accrued bond interest	1,042	1,250	1,458	1,658
Tax reserve	.....	.....	7,015,280	908,166
Reserved for payment of deferred dividends	214,869	264,918	418,013	547,390
Insurance and contingency reserves	6,932,853	6,802,062	3,187,093	2,107,718
Surplus	14,802,790	23,875,180	32,818,069	22,262,167
Total	$101,249,177	$101,869,991	$98,390,951	$87,784,918

*Includes cash advances for logging operations.

President Dodge's Remarks

In his remarks to stockholders, President Philip T. Dodge said, in part:

"As a result of conditions following the war, the long strike of the thousands of misguided workmen, and the failure of the government to protect the news print industry from the attacks of competitive countries, your company has, in common with nearly all the larger industrial corporations, suffered a substantial loss during the year. This loss, which will be avoided in the future, was due in great part to the consumption of high-priced wood necessarily contracted for at war prices, and largely accumulated during the period of the strike when the mills, now in full operation, were closed.

"In order to present a sound and truthful showing of the financial condition of the company, the inventories of wood and other important materials, as in the previous year, have been depreciated or marked down to meet present market prices, and full and proper depreciation of the plants has also been carried into the books, so that the figures presented by the treasurer may be considered as a conservative statement of the value of the huge properties controlled by the company; in other words, the figures represent no inflation and no speculative values.

"It is a gratifying fact that during the year the volume of business has been expanded to normal from the low point following the strike. The increased consumption of all grades of paper in the United States was reflected by an increase in production. While the production for 1921 was 27 per cent less than in 1920, the production of 1922 was only 5 per cent less than in 1920—the high water year—and during the latter part of 1922 the rate was in excess of 1920.

"The recent coal strike, of five months' duration, added materially to the cost of manufacturing paper, and it was with great difficulty that certain of the mills were kept in operation.

"In conclusion, at the time of this writing the conditions have vastly improved in many ways, the demand for paper is large, the labor conditions are harmonious, and the company is on a profitable basis.

"While it is not a duty to make predictions, the numerous inquiries from small shareholders, of whom there are several thousand, seem to justify the statement that there is no danger of a discontinuance of the dividends on the preferred stock."

ALLIED PAPER MILLS IMPROVEMENTS

The Allied Paper Mills expended over $100,000 during 1922 in improvements to the King, Monarch and Bardeen divisions, according to Alex. G. Gilman, president of the company. The various units of this concern are in the finest physical condition and are being maintained on that basis.

Among the recent betterments at the King division are a new roof for the entire machine room, accommodating four Fourdrinier machines, the dismantling of the monitors and the installation of the Ross Engineering Company's approved system of condensation. The galvanized work was done by the Kalamazoo Sheet Metal Company, Jacob A. Temple, manager.

In the King boiler house two 500 horsepower vertical Wickes boilers have also been installed, thus giving sufficient power with which to turn all machinery on an efficient production basis. Another improvement in the machine room was laying a cement floor in the old division.

The Monarch division has been improved by laying a new cement floor in both the basement and main floors of the calender and finish rooms. One battery of five coating machines has been equipped with the Ross Engineering drying system.

At the Bardeen division, jordons have been removed and two Marshall refining engines installed in their place.

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In buying your *Sulphate of Alumina*, let the 84 years of chemical experience behind the GRASSELLI name be at once your guide and your protection. Your satisfaction is certain because the name GRASSELLI not only stands for years of experience and leadership but the utmost in chemical purity and quality.

GRASSELLI GRADE SULPHATE OF ALUMINA, Iron Free, is particularly adapted to the production of those fine papers where it is essential to prevent discoloration of the paper stock. It will give unfailingly uniform results.

Phone, wire or write our nearest office for quotations. GRASSELLI means *Service*.

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The GRASSELLI CHEMICAL CO.
Established 1839
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New York	St. Louis	Paterson
St. Paul	New Haven	Albany
New Orleans	Philadelphia	Milwaukee
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GRASSELLI GRADE
A Standard Held High for 84 Years

MANUFACTURERS IN CONVENTION

Forty-sixth Annual Meeting of American Paper and Pulp Association at Waldorf-Astoria, New York, Is Largely Attended

Henry W. Stokes, President of the York Haven Paper Co., York Haven, Pa., Is Chosen to Head the Association—Former President Raybold in Annual Address Says Era of Prosperity Is Here Which Will Last for Some Time to Come—Commends Co-operation Existing Between Manufacturer's Association and National Paper Trade Association—Dr. Baker Reviews Association's Work for Year.

The buoyant optimism reflected in the Convention of the American Paper and Pulp Association last April, in the face of the trying year which the industry had experienced, was replaced at the Forty-sixth Annual Convention, held this week at the Waldorf-Astoria, by a dominant note of confidence. A year ago fundamental economic conditions were far from settled. The drastic declines of 1921 were still wreaking their havoc in several war-inflated paper markets and American manufacturers were confronted with the grim task of writing off inventory losses at the time of the 1922 Convention.

Great Change in Year

So complete has the metamorphosis been in the course of the past year that the prayerful optimism of producers a year ago has now given way to a settled conviction that normal conditions have returned and that business will continue to prosper for the balance of the current year. A conservative note has crept in with the return of steady, healthy activity in practically every phase of the pulp, paper and paper stock industries, and though present-day conditions far better justify the painting of roseate-hued dreams for 1923-24 than was the case a year ago, the manufacturers in convention were inclined to hold in check any exuberance they may have felt in the distinct turn for the better.

During the past year the paper industry has more than lived up to the glamorous predictions made during convention week. Not only has it survived a year teeming with economic crises—the coal strike, the rail tieup, numerous strikes and labor difficulties, the car shortage, and the tariff unsettlement—but it has also emerged practically unscathed from the severe climatic conditions which have obtained throughout the year. The unusually dry summer of 1922 seriously hampered the production of mechanical pulp, while the freezeups and heavy snows of the winter months served to aggravate this situation as well as greatly to impede the shipment of both finished paper and raw materials.

HENRY W. STOKES, PRESIDENT

Unusual Interest Shown

But these troubles were, for the most part, forgotten when paper men from all parts of North America convened at the Waldorf to exchange notes and lay plans for the year ahead. Up until Thursday noon an entire floor of the hotel seethed with the hum of voices, the scurrying of paper men from one meeting to another. Everywhere the atmosphere of brisk activity was in evidence. Manufacturers flocked to the sectional meetings. The discussions were conducted with vigor. At no point during the week did the enthusiasm pall. There were too many things to talk about; too many new ideas to absorb to have matters stale.

President Raybold's Remarks

The General Session of the association opened at 10:30 a. m., Thursday, April 12. The attendance was probably the largest on record. No time was wasted in getting to the business at hand. In lieu of the usual President's Address, President Raybold announced that a statement of the condition of the Pulp and Paper Industry would be distributed to the members attending the session and that he would speak but briefly.

Referring to the issued statement, President Raybold styled it as being "a very conservative and not over-enthusiastic digest of the existing situation." "We do not feel justified in predicting too optimistic a future," said he, "but apart from what we have published, we do feel that the present era of prosperity will continue for some time to come.

"We base our feelings on the fact that practically all of the mills in the country are now operating, on the fact that there

KENWOOD MILLS, ALBANY, N. Y.

KENWOOD

FELTS AND TAN JACKETS

KENWOOD WOOL PRODUCTS

For every kind of paper and pulp

Designed to meet the especial requirements of each kind of paper and type of paper making machine. Full particulars regarding the most satisfactory combination for your particular requirements will be gladly furnished on request.

F. C. HUYCK & SONS

KENWOOD MILLS
Albany, N. Y.

KENWOOD MILLS LTD.
Arnprior, Ontario, Canada

KENWOOD MILLS LTD., ARNPRIOR, ONTARIO

is little or no storing up of paper anywhere along the line and because the demand for paper seems to be continually increasing, even more than the eight per cent increase in population would naturally justify.

"Besides these facts in our industry we see prosperity throughout business in all industries. For instance, an announcement has recently been made by a New York paper that plans are already under way for about $5,000,000,000 worth of building during the coming year. Labor is fully employed and at good wages. The farmers in both the West and the South are getting good prices for the crops.

"With these fundamental things in the condition that they are, we feel that we are experiencing the best conditions possible but we did not wish to put this into what should be a purely business statement."

President Raybold cited a recent occurrence, when one of the largest paper dealers in the East had his warehouses destroyed by fire and told how he had been offered all manner of assistance by his business competitors. "This could not have occurred fifty years ago," he declared. "And it means that we are learning the lesson of the value of a spirit of confidence and fellowship and helpfulness, for an injury to any one of us is an injury to the whole group.

"We have built up our organization to a point where an incident like the one I have told you about can happen, and it is a big thing to do."

A high tribute was paid by the president to the efficient work of the employed officers of the organization, Dr. Hugh P. Baker, W. B. Bullock and O. M. Porter.

Calling it a "pet hobby" of his own, President Raybold advanced the hope that some day there might be a joint organization which would include both the manufacturing and the distributing ends. He mentioned the high degree of co-operation which has been had with the National Paper Trade Association during the past year and declared that such an organization as he contemplated would increase the degree of mutual aid and benefit.

After explaining that the $10 registration fee had been instituted to wipe out the existing deficit of the association, President Raybold read an interesting cablegram from Stockholm, Sweden, which announced the end of the strike in the pulp and paper industries in Sweden. He also read a telegram from J. D. A. Morrow regarding the bituminous coal situation in the country.

The New Officers

The following officers were elected for the ensuing year:

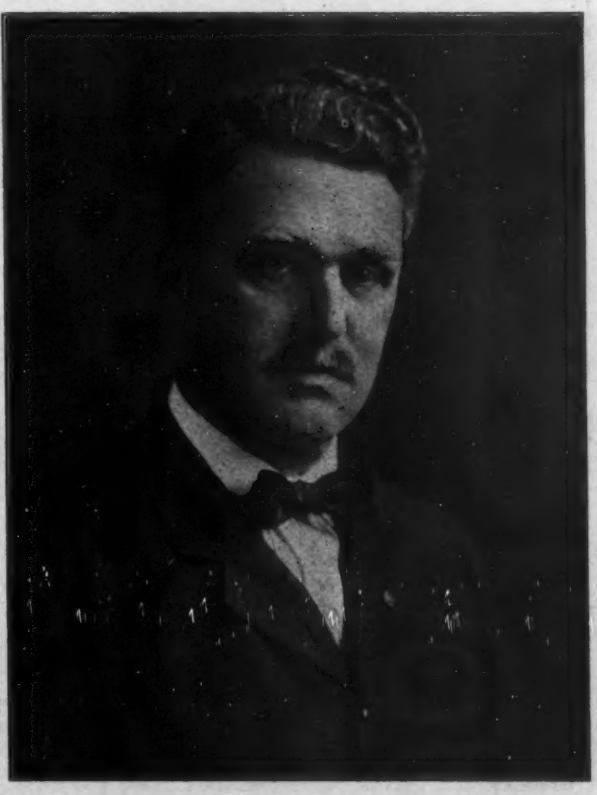
President—Henry W. Stokes, York Haven Paper Company of York Haven, Pa.

Eastern Vice-president—Norman W. Wilson, Hammermill Paper Company.

Western Vice-president—Walter J. Randall, Champion Coated Paper Company.

Secretary-treasurer—Dr. Hugh P. Baker, 18 East Forty-first street, New York.

Members of the Executive Committee at Large—Col. W. E. Haskell, of the International Paper Company; Louis Bloch, of the Crown-Willamette Paper Company; and L. H. Davey, of W. O. Davey & Sons.



DR. HUGH P. BAKER, SECRETARY-TREASURER

REPORT OF THE SECRETARY-TREASURER

Dr. Hugh P. B. Baker, secretary-treasurer of the association, read his annual report as follows:

As the paper industry was one of the last of the large industries of the country to feel the serious business depression through which the country has passed recently, so the associations in the paper industry did not get the full effect of the business depression until after the industry itself had gone through the depression. The activities of an association in any given year, and its support, are controlled pretty largely by conditions in the industry, which that association serves, of the year previous or even two years previous.

The past year, therefore, has been in a way a year of depression for the Association, in that it reflected the financial conditions of a year ago in the industry. Fortunately, because of the leadership which the Association has had in its President the depression has been a financial one only and not a depression in morale or in accomplishments.

In the report of last year it was emphasized that if there is ever a time when a trade association should be of service to the manufacturer it is in a period of difficult business depression. The past year's experience has proven this assertion in that the well organized associations have been giving more effective service to the groups which they represent, and the less thoroughly organized associations have been feeling the demand of their membership for greater efficiency. That is, manufacturers have come to appreciate as never before that a trade association stands for certain definite accomplishments for the industry, and it is really fortunate that this knowledge has come to the industry, as the greater the demands for service the more effective the association should be.

It is possible that some of the association in the paper industry, and some in other industries, have come to feel that business conditions warrant them doing certain things that are pretty generally recognized as activities that may lead to difficulties under the law. What a legitimate trade association can and cannot do has been very clearly established, and there is no real need today for either a secretary of a trade association or for a manufacturer pleading ignorance as to what may be done legally under our present anti-trust legislation. Various decisions by the courts in the so-called Linseed Oil case, the Gypsum case, the Maple Flooring case, etc., have not changed the relationship of trade associations to anti-trust legislation in any way. Most of these court decisions have dealt with particular cases of disobedience to law, and no attempt has been made in these various decisions to interpret our anti-trust legislation as it affects trade associations generally. Some associations by going a step beyond the legal limit may do certain things for their members that those members temporarily may feel to be of such great assistance that

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they are willing to take the risk. We deprecate this attitude and hope sincerely that associations in the paper industry will be guided by the very able legal counsel retained by these associations.

Membership Campaign

There are few organizations of men where a 100 per cent membership means as much as in a trade association. The value of the work of the association is affected very largely by the ability of that association to represent the industry effectively with other national organizations, before the public, and before the law-making bodies of the Federal government and the states.

A membership campaign carried on during the last six months of the past year emphasizes the above statement, which was made in the report of last year. It was urged last year that an aggressive membership campaign be carried on but such a campaign was delayed, as it was the year previous, because of unsatisfactory business conditions. However, the membership campaign has been under way for nearly six months with very satisfactory results.

A personal letter was written to every one of the nearly 400 members of the Association explaining the need for better representation of the entire industry, and asking that each member secure one new member. This letter brought a surprising number of replies from the membership and in some cases members went to the trouble of writing numerous personal letters in behalf of the Association. Literature was prepared for this campaign, telling of the past year's activities in the Association, and this literature taken out to mills not now members by the personal activity of the membership has resulted in adding to the membership of affiliated associations and to the membership of this Association directly. This personal work has been so satisfactory that it will be continued as a year round membership campaign.

Getting Acquainted With Manufacturers

It has become increasingly clear, as your secretary has carried forward the work of the Association, that one of the difficult problems in a federated trade association is the bringing about of real acquaintanceship between the secretary and the executives in the industry, particularly those executives who are active in affiliated associations. The average executive very rightly considers his first allegiance to be to his affiliated association and the giving of this allegiance sometimes exhausts his interest in and the time which he has to give to trade association work. In other words, as we have gone to the manufacturers with the activities of the American Paper and Pulp Association they have often been exhausted in the activities of their affiliated associations and have little time for the federated organization.

To meet this problem of acquaintanceship an effort was made by the secretary to get acquainted by personal visits at the mills. One paper mill section was chosen and the secretary spent some little time in calling at the mills. He was never received other than in a very courteous, kindly way, but to attempt to interest the executives in the activities of the federated association in their own offices, where they have the pressing daily problems directly in front of them, and where others are waiting to see them in this matter and that, proved to be an unsatisfactory solution of the acquaintanceship problem.

After going over the situation of "getting acquainted" carefully it was finally decided to go into the different papermaking sections for the holding of luncheons of paper manufacturers. During the last six months of the year luncheons were held in Richmond, Va., Middletown, Ohio, Wausau and Neenah, Wis. Arrangements for these luncheons were made by local executives in those various sections, and your officers are very appreciative of the help which these various men gave in making these luncheons successful. The holding of these four luncheons has proven conclusively that this is a method of getting acquainted that is both more effective and more economical for the secretary of a federated association than generally to attempt to make personal calls at all of the mills.

Your Executive Committee has been urged to make these luncheons an annual affair, and the suggestion has been made that next year the president or a member of the Executive Committee accompany the secretary, and it has been urged also that in connection with these luncheons specific problems, such as uniform cost systems, income tax matters, technical matters, and similar problems before the industry, be presented and discussed.

Forms of Service by an Association

There are two forms of service given by all of the associations in the paper industry. The first and most effective form is what might be called "direct service," such as preparation of statistics, the holding of meetings, the giving of information as to raw materials, traffic conditions, and the personal work of the secretary given in the form of prompt replies to inquiries of all sorts. The second form of service is the representation of the group which the Association serves with other groups in the industry or with other industries; the watching of helpful and harmful legislation which the Association is always in position to work aggressively for or against, and, finally, the representation of the group before the public.

The problem before this Association has been to develop more effectively the first form of service to its membership, that is, direct service and that without conflicting with the effective work of the affiliated associations. There is an amazing amount of indirect service which your Association is giving constantly, which it is difficult to measure the value of or to report upon in a satisfactory way. That the forms of service given by the Association might be clearer to the entire membership we have issued the past two years leaflets telling of the accomplishments of the Association. The leaflet this year is entitled "Forward Steps in 1922." It would be out of place to record here the major accomplishments of the past year. It is in place here, however, to emphasize the fact that with the effective, aggressively working organization which you now have in the American Paper and Pulp Association we are able to give very direct service in the answering of almost any inquiry as to the industry.

You have assisted in the upbuilding of our Information Service, which will be reported upon briefly later. The work of this Information Service in taking the industry to the public has brought a surprising number of inquiries from all sorts of sources to the Association. These inquiries come from banks, business houses, schools, and colleges, foreign countries, and from the public at large. Very many of these inquiries indicate gross ignorance as to the paper industry. Your Association feels that it is a very distinct value to you that there be less of ignorance and more of real information as to the industry on the part of banks and business houses and the public. We are hoping that the membership generally will make greater use of the ability of the Association to reply promptly to an inquiry as to any phase of the industry.

Service Associations Assisting in Direct Service

The presence in the offices of this Association of the Technical, the Cost, and the Salesmen's Associations, who have been at all times very ready to give of their time, has made it increasingly possible to answer questions as to technical matters, cost and income tax matters, selling problems, and other phases of activities of our industry in which these various associations are interested.

We are hopeful that the Superintendents' Association, which has been doing excellent work for its own membership and for the industry, may be brought to work more closely with this association directly or through the Technical Association. The Superintendents' Association is gradually accumulating a mass of information, based upon practical experience, which should be made available to the entirely industry—as, after all, the service associations are in existence to serve the industry as well as their individual membership.

Activities of Committees

The policy as to committee activities adopted a year ago, that is the doing away with standing committees and their replacement by

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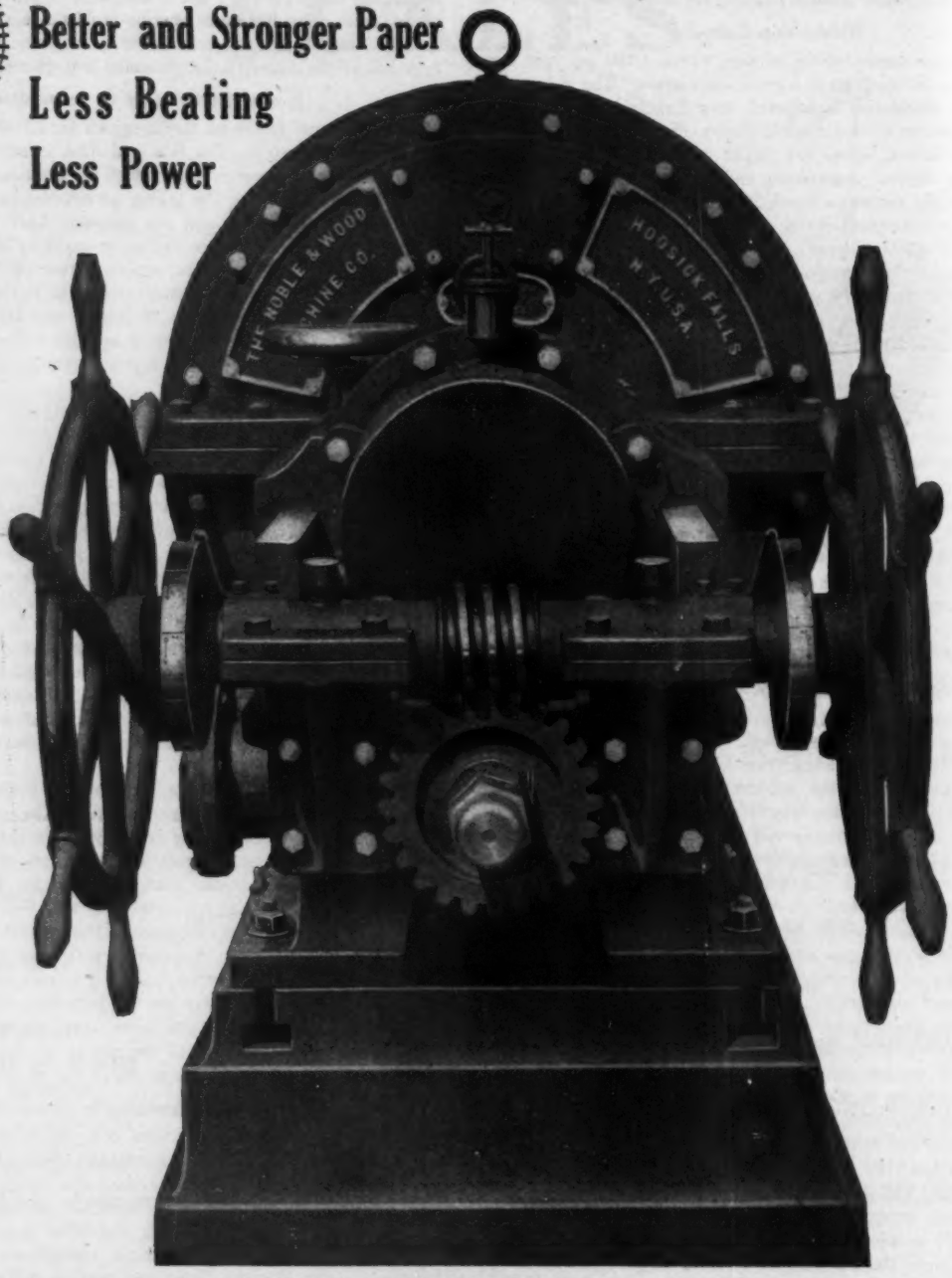

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special committees appointed to do a particular piece of work has been carried through the past year. The standing committees have been kept up only as there seems to be special work to be done through the year. The adoption of this policy has proven wise and will be carried through the coming year.

It was pointed out last year that a considerable number of standing committees, presumably active upon different phases of work of the Association, may make an excellent showing in a secretary's report. However, where a standing committee is in existence and where it is not definitely engaged in active work there cannot but be a feeling on the part of the members of that committee, that if the committee itself is not active, the Association is not at work.

Several committees have been active during most of the year. The Tariff Committee, of which Henry W. Stokes is chairman, while not having as much to do as during the previous year, has been constantly on the watch to see that the interests of the industry are taken care of in the activities of the Tariff Commission and other governmental agencies. A short report by Mr. Stokes' committee appears on another page.

The Committee on Forest Conservation has been continued and its chairman, George W. Sisson, Jr., has appeared at meetings and hearings in Washington and Albany in defense of the industry. Regardless of the way some of the mills may feel as to the value of work put upon forestry, this subject promises to be one of the big questions before all of the wood-using industries. The Association has a real piece of work to do through its Committee on Forest Conservation, in not only watching harmful legislation but in assisting in the development of constructive legislation and in taking part in activities that are essentially educational in value as well as helping directly in making our forests and forest lands more productive.

The two special committees appointed last year, one the Advisory Committee from the Paper Industry for the Paper Section of the Bureau of Standards, of which Mr. Arthur H. Nevius is chairman, and the other the Committee for the Department of Commerce, of which Mr. W. J. Raybold is chairman, have both been active and have accomplished real results for the industry.

Brief reports from the Advisory Committee from the Paper Industry for the Paper Section of the Bureau of Standards, and from the Committee on the Department of Commerce, will appear later.

The Committee on the Department of Commerce has been received so cordially by that department, and has been so helpful in representing the industry in certain matters in Washington, both before the Department of Commerce and other departments, that another committee has now been proposed to represent the paper industry in the work of the United States Department of Agriculture, primarily in the work of the Forest Service, a bureau of that department. Some suggestions as to personnel have been made to Secretary Wallace and it is expected that the committee will be appointed soon.

Information Service

This service was organized in 1921, under a special fund which had been contributed by both members and non-members. Warren B. Bullock, a trained newspaper man, was placed in charge of the service and there seems now to be no further questions as to the very important work which such a service can do for our membership and for the industry.

Mr. Bullock has not only greatly improved the regular *Bulletin* of the Association, but he has done much in giving the Association and the industry representation in the public press and in trade journals of this industry and of other industries. This service has become increasingly, during the past year, an Information Service. General inquiries coming to the Association are taken care of by this service and there is being developed a mass of information that should be increasingly valuable to our membership.

The part which the Association has played in the Paper Industries Exposition, which is being held for the first time this year, has been carried through largely by the Information Service. Mr. Bullock has worked constantly with the International Exposition Company, which is putting on the Exposition, and has helped materially in making the Exposition really representative of the entire industry.

Probably the most valuable work which the Information Service has done the past year is the securing of direct contact with a large number of banks in the various papermaking sections. This service carried through in 1922 an organized campaign to bring out larger supplies of waste paper to meet the emergency shortage. It organized monthly service on general market conditions for paper manufacturers, and it has been very helpful in the house slogan activities among the members of the Association, and in supplying moving picture films, slides and exhibit material, not only to our members but to non-members as well.

Woodlands Section

The Woodlands Section was organized in 1920 for the purpose of bringing together the executives and the men in those companies having to do with the handling of forest property. For the first time in its many years of active work the Association, through this Section, has been providing accurate statistics as to the wood situation, as it affects the paper industry. Wood is the raw material of a very large part of the industry and it is increasingly important, in view of our diminishing forest areas, that we should have information of an accurate character as to available supplies of wood, both in this country and in Canada.

O. M. Porter, assistant secretary of this Association, has carried through the entire development of this Section in a way that has been of unusual service not only along the lines of statistics, but to the men actually handling timberlands for pulp and paper manufacturers. In fact the work of this Section has been so satisfactory that request has come from the Canadian Pulp and Paper Association that statistics and information sent out from our Woodlands Section should be sent to members of the Canadian Woodlands Section, and at their expense.

Necessity for Better Knowledge of Foreign Affairs

Since coming into the Association in 1920, your secretary has been impressed constantly with the necessity for better knowledge of not only Scandinavian conditions but conditions on the mainland of Europe, and market conditions in South America. Many of our paper mills have come to depend upon the high grade pulp turned out by the Scandinavian mills, and while the amount of that pulp brought into this country in any one year may not be large as compared with the total amount of pulp consumed, nevertheless it is large enough to affect the market for pulp in this country, and the output of our domestic pulp mills. This fact has been made increasingly clear as the result of the pulp strike in Sweden the past months, regarding which the Association has kept the industry thoroughly well informed.

It seemed to your secretary that he could be of greater service to the membership if he could have personal knowledge of Scandinavian conditions. The suggestion was made, therefore, to the president of the Association that he be allowed to spend the past summer in Scandinavia. While the Association could not and did not finance the trip to Scandinavia, nevertheless the trip was made and the beneficial results of this trip have been felt, not only by the secretary but by the industry at large. Your secretary was very greatly assisted in the Scandinavian trip by George W. Sisson, Jr., of the Racquette River Paper Company, a past president of the Association, who made the trip at his own expense. While Mr. Sisson made the trip because of his own interest in foreign conditions, yet the presence in Scandinavia of an American manufacturer with your secretary made it much easier for the Association to secure the information desired, and made the reception of your secretary much more satisfactory and worth while.

The results of the Scandinavian trip have been reported in part

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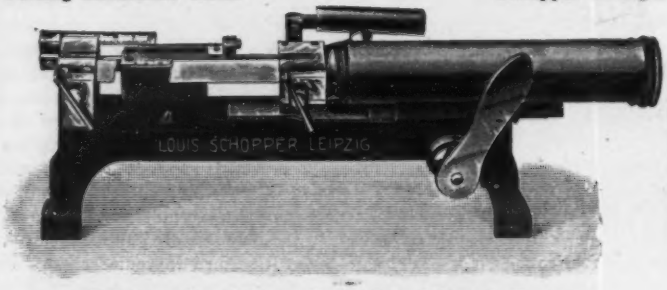

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to the membership, and the recommendation has been made that small groups of technical men from our industry be sent to Scandinavia annually, and that from time to time groups of executives visit the pulp and paper mills of Scandinavia. We would like to repeat this recommendation and urge that means be developed to keep in much closer contact with the whole European pulp and paper situation.

In this connection, it is in place to emphasize that the paper industry of this country is concerned with the development of a foreign market. Many manufacturers will say at once that we are not concerned. However, when it is known generally that the value of our exports of pulp and paper goods in 1920 was over eighty million dollars and in 1921 over fifty million dollars, and in 1922 over twenty-four million dollars, it will be appreciated that we have a foreign market and that there are great possibilities for increasing this market. The South American market is logically our market rather than the market for the European mills, and we will have that market when we make the proper effort to secure it and hold it.

Contact With the Federal Government

It is safe to assume, and many of our manufacturers will assert as the result of more or less expensive experience, that the Federal Government is continuing with passing years to take greater cognizance of economic conditions generally, and of the individual business of paper manufacturers, and all of the other manufacturers of the country. So long as this is the case it would appear to be wisdom for the industries generally to develop more effective co-operation as between the business men of the country and the Federal Government. To put it in another way, there are mighty few arguments against such co-operation. When the Federal Government, through its tax laws, tariff regulation, the activities of the Federal Trade Commission, and the Department of Justice, can pretty nearly control the success of business, it would seem logical that manufacturers and business men generally should come together and work actively with all of the departments of the government at Washington for the sake of protection, if for no other reason.

During the past three years, we have made very definite effort to bring the paper industry into the right contact with the various governmental bureaus and with Congress. The visit of some 14 paper manufacturers, making up in part the Committee on the Department of Commerce to Washington in January, where they met Secretary Hoover and the Director of the Bureau of Foreign and Domestic Commerce, and where they had at lunch with them General Lord, the Director of the Bureau of the Budget, and later spent an hour with three of the members of the Tariff Commission, is indicative of what may be accomplished in developing a contact that makes it possible for the government officials to visualize the industry and to appreciate that the paper industry is in the control of business men of standing and vision. After all, business is done in our industry on the basis of acquaintanceship and good faith. Satisfactory business relations with the government must be based upon the same conditions.

Your secretary is the last man in the industry to suggest that we should run to Washington with every little problem that comes up in the industry. On the other hand, he believes wholeheartedly that reasonable and effective co-operation with the government bureaus in Washington will reflect beneficially upon the entire industry.

Income Tax Activities

Your attention has been directed before to the fact that the industry has spent a good deal of money and has done very effective work in the past through the Income Tax Questionnaire Committee of the Association. With the completion of the questionnaire the work of that committee ceased. Income tax as a form of taxation has come to stay and will be a problem which all must face for many years to come, yet we stopped our unified action with the closing up of the work of the Income Tax Questionnaire Committee, and are now struggling along as individuals to meet the situation which other industries are meeting in a co-operative way—to their great advantage.

The Association is not seeking to add to its force except where service of real worth can be given the membership. Your secretary has appeared before meetings of some of the affiliated associations, urging that an income tax expert or an income tax bureau be placed in the Association. This was urged not that it is expected that an income tax expert would assist any single mill to fill out its returns, but rather that there be a man who understands the income tax laws thoroughly as affecting this industry who could keep in touch with the situation at Washington, and who could go into each of the paper-making sections in any given year to go over the technicalities of the law and recent rulings of the law, with groups of men who are making out returns for the various mills. Knowing what other industries are doing along this line, and how they are profiting as the result of such activities your secretary would be remiss if he did not continue to emphasize the vital importance of a co-operative activity such as could be made of great value through an income tax bureau.

In the same way, a very important piece of work could be done for the industry by having in its employ a man who understands thoroughly the importation of pulp and paper. Every time that a shipment of paper is brought into this country and undervalued, or wrongly classified, it injures the industry. No one can estimate the amount of paper that is being brought in and wrongly classified and undervalued. In a small way the Association is keeping in as close touch as it can with customs officials at the port of New York, and elsewhere, and the specific cases which the customs officials of New York have brought to the attention of the Association in the past six months are clearly indicative of the very great help which could be given the entire industry if this work could be handled in an effective way. Furthermore, such a man could keep the industry thoroughly informed as to the pulp coming into this country, how much is in warehouses, etc. The value of this information does not need to be enlarged upon.

The two activities just described and recommended as important activities to the industry are good examples of the general service which a federated organization such as this should be able to give to the industry but which it is difficult often for a single manufacturer to see clearly as of definite advantage to him. It is the old story that everybody's business is nobody's business. Yet your secretary is so convinced of the necessity for service along these lines that he will continue to emphasize them with the hope that eventually such service may be given, and that in a way that will be immediately appreciated and the wonder will be then why such service was not given before.

Next Year

With improving business conditions, next year should be a much better year for all of your associations. Your secretaries count the year a better year when there is greater opportunity for service, and when they feel that they have made their work count for something in the upbuilding of the industry. Progress has been made the past year, and if it is true, as the economists are seeking to prove, that we are facing a long period of declining prices when competition will be keener and the margin of profits smaller, then your Associations should be of increasing service in helping you by every lawful means to continue business at a profit even with declining prices and a narrower margin of profit.

The fundamental need the coming year is for a sounder and a more effective method of financing this Association. It should not be necessary for your secretary to spend a half to two-thirds of his time in trying to solve the problem of financing the association's activities. This is an old association and it has been in existence long enough for a very definite conclusion to be reached as to the value of its work. Either the work is worth while or it is not.

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This Association is worth while and three years of service with you has made me believe tremendously in the industry, in you men who make up the industry, and in the Association. Your secretary is convinced that if this Association should be wiped out tomorrow that you would be forced to have another central organization within six months, and that because you are facing more drastic control by the Federal and State governments, radical legislation of all kinds, and a competition from foreign countries which must force unified action.

Your secretary is keenly appreciative of the opportunity afforded him of working another year with President Raybold. Few members of the Association appreciate the time and thought demanded of the president. He has met all of the demands from the Association in a kindly, generous spirit that has meant very much to those of us who are carrying the work of your Association here in New York.

The spirit of friendliness and support extended your secretary by members of the Executive Committee, the secretaries of affiliated associations, and his associates in the Association, has meant everything in carrying on the work as you want it carried on. The Association after all, like any organization of men, is what the members make of it. Your officers can but assist, and to repeat the closing sentence of the report of last year, "how much that assistance will mean to the Association will depend entirely upon the way in which you meet, not only the secretary, but your president, and your Executive Committee, in the work which they are trying to do for you."

THE LABOR SITUATION

Benjamin M. Anderson, Jr., Ph.D., economist of the Chase National Bank of New York, spoke to the convention on "The Labor Situation," saying in part:

We face, at the present time, a labor situation unprecedented in our pre-war history, though the experience of late 1919 and early 1920 enables us to gauge something of its character. In pre-war days business expansion in the United States was usually accompanied by a great increase in immigration, while periods of business depression usually led to a sharp reversal in the movement, many European laborers returning to their homes. Our labor supply was very elastic, and this was particularly true of unskilled labor. The flow of labor in and out of the country, as the demand for labor varied, minimized wage fluctuations, softened unemployement in periods of depression and eased the acute stringencies in the labor markets which booms would otherwise have developed. Even in pre-war days we had acute periods of unemployment, and in many trades acute shortage in times of great activity, but we had nothing like the inelasticity of labor supply which we face today.

With labor shortage comes rapidly rising labor costs. First, and obviously, with labor shortage and industries competing against one another for labor supply, wages rise. Second, with increased bidding for labor, shop discipline becomes increasingly difficult. Laborers, knowing that they can get work for the asking at another place, submit less readily to necessary rules, regulations, reprimands and control. Third, in such a situation, labor turnover becomes increasingly rapid, as we saw late in 1919 and early in 1920. Every change in personnel entails loss of time and some degree of re-education, and represents addition to cost. Fourth, the tendency to overtime work increases, and overtime work is costly from two angles. Overtime wage rates are higher than regular rates, and overtime work, if long continued, means increasing weariness and lessened efficiency on the part of labor. In general, labor shortage leads to a very sharp increase in labor costs due to a combination of higher wages and reduced efficiency. This is often intensified, notably in the building trades, by deliberate policy on the part of laborers in reducing output by the day when demand for their services is very brisk.

Similar phenomena have manifested themselves in every period of active business in greater or less degree. Our present immigration policy means that they may be expected to manifest themselves earlier and more sharply in the present movement than was usual in pre-war days.

Given time, business men may be expected to make whatever readjustments are necessary in bringing about a proper proportion among the factors of production. Readjustments of this sort take time, however. There is involved the substitution of a great deal of labor saving machinery for hand labor. In principle there are very many operations now performed by hand which can be taken over by a machine. Whenever a mechanical operation calls for a fairly monotonous repetition of relatively simple operations a machine can be devised for performing it. The question of whether a machine will be used or hand labor used is primarily a question of comparative costs—the cost of the machine as against the wages of labor. Machine stoking of furnaces, for example, has been in use in many places, for a great many years. Rising wages of hand stokers will lead to the substitution of mechanical stoking in many more places, as it will lead to the substitution of oil-burning for coal-burning engines in many cases.

A further necessary step in the readjustment to the permanently shorter labor supply is the abandonment of those industries which require a very large amount of hand labor, and the concentration upon those industries which are characterized by machine processes and mass production. In the international division of labor, countries specialize along the lines of comparative advantage. Countries where labor is abundant and capital scarce can specialize in working up individual orders and producing from a variety of patterns. Countries where labor must be economized and where capital can be used lavishly tend to do best in quantity production from a few patterns.

The problem of labor shortage, however, is one thing and the problem of an inelastic labor supply is another thing. If labor is to be relatively less abundant as compared with the land and capital employed in agriculture and industry, and if, to meet that, long run readjustments are made in the proportions of land, labor and capital, we have still left unsolved the problem that arises in short run periods from our inability to increase through immigration the labor supply in boom periods. Managers of industry will, in time, learn to adjust themselves to this factor also, but there is little in past experience which suggests a ready solution of it, and, in the present situation, it must be looked upon as a distinctly adverse factor whose importance is not readily calculable.

ASSOCIATIONS ON INDUSTRIAL PROGRESS

E. W. McCullough, manager Fabricated Production Department of the Chamber of Commerce of the United States, addressed the convention on "Trade Associations in Industrial Progress," saying in part:

The trade association was created primarily to bring concerns in an industry together to meet the larger and common needs of that particular line and not as a service organization to deal with the individual troubles of its members, nor act as a life saver to a business not fitted to survive fair competition either in production or selling. Many trade associations have developed splendid service to individual members, and it is a worthy endeavor, but let us not be confused by it but keep before us that the industry as a whole has the first call upon the service of the organizer.

We have before us the difficult task of bringing together hundreds of competing units in occasional meetings and conferences to select from the problems of an industry those which are most important and common to the greater number.

From the time when organizations were created largely for defensive purposes to oppose inimical legislation, both national and

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state, and to resist unjust demands of those in control of our materials and transportation, we have passed into an era vastly more constructive and important, that of advancing the industry to higher levels, not only in the mechanics of production, but in commercial practices in the industry and service to the ultimate consumer.

I need only mention a few of these activities to picture to you the changed conditions from the time when an association meeting was a sort of armed neutrality, many coming to listen but not to talk:

Statistics of the trade both as to materials and completed product.

Research, scientific and economic, to eliminate waste.

Accounting, including studies of cost methods and general accounting for business control.

Simplification and Standardization, to determine the selection of profitable varieties of sizes, styles and kinds.

Advertising, the educational kind, to inform the public as to facts important to intelligent buying.

Quality Standards, voluntarily set up by the industry and protected by it.

Foreign Commerce, studied in its relation to the import of raw materials, also as to marketing and competition.

Safety and Welfare, studied as to their application to your industry.

Ethical Codes or Business Principles, something more than moral law, to inform the newcomer as to the rules of the game and as a reminder to old-timers as well.

All of the foregoing are of direct concern to the entire industry and of constructive and progressive character, promoting common knowledge that must lead to more intelligent competition. Moreover, they are activities which can be engaged in with safety and the least temptation to wander in forbidden paths. They are, however, not easy of accomplishment under present conditions, because too many of the members of most trades today are failing in adequate co-operation. Too many joint co-operative associations as they buy service from private organizations with the feeling that the fee or dues paid is all there is to it, and that service and benefits will at once flow through the secretary's office.

Recently there has been some turning to private agencies for statistical service, giving as a reason that their association did not seem to be able to supply it, yet this data must be secured, if reliable, largely from the concerns making up the association. The very members who complain are frequently contributors to the delinquency of the association in functioning—they do not furnish their quota of information, yet in buying statistical information they not only pay handsomely for it but sign an ironclad agreement to supply their data when, how, and as called for—the service could not be made successful any other way. The moral obligation to a voluntary trade association is or should be just as binding and members who do not so regard it thereby contribute to the failures of those efforts of the association which do not succeed.

Perhaps we may find something between the binding of the so-called "gentlemen's agreement" which is not permitted, and the present looseness of voluntary observance of our association obligations, but here rests the cardinal weakness of most trade associations in working out their problems.

Let us now consider briefly the relations of the trade organization to the government, both national and state. Contrary to the opinion prevailing in some quarters, our anti-trust laws were not designed especially for the regulation of trade associations; in fact, at the time of the enactment of the Sherman law there were not so many such organizations and they were generally pursuing rather conventional programs of meeting for good fellowship, passing resolutions of good intent, but too often forgetting most of them before the next annual gathering.

The government's desire to regulate business became more apparent at the time of the passage of the Clayton and Federal Trade Commission laws. The growth of business had been rapid and brought about many complexities in business methods. Our country, once agricultural, changed in a short time to one leading the world in the importance of its industry and commerce. It was not strange, therefore, that legislation for injecting government into business in certain forms was enacted; in fact, as we have it, and I believe to stay, we may more profitably consider what are its requirements and do they really hamper our freedom. Theoretically and by statute the citizen is guaranteed equality of opportunity. This we agree is also morally right and we cannot quarrel with either our lawmakers or executives if the organizations we set up are also compelled to observe it.

A certain western state noted for its radical representation in Congress and revolutionary tendencies at home, has, because of its destructive legislation, driven out one of its largest manufacturers, who may be followed by many others, which that state can ill afford to lose. Such tendencies must be fought and trade associations can through co-operation do much to bring about much relief, for, in my opinion, the line of attack should be much the same as that employed by several large industrial concerns dealing with industrial relations who are visualizing for their employees the component factors making up business costs, clearly setting forth the relations of labor in making or retarding success in securing and holding business.

To determine whether a trade association action or undertaking falls within such a prohibition is not difficult for an average group of business men; in fact, in most of the trust law cases tried the intent to disregard the law is rather clearly shown. Again, in those instances where the consent decree method of settlement was employed there is a suspicion that the violations were more than merely technical.

Therefore, it would seem that until by amendment or other means of clarification our trust laws are made so that the average business man may read and understand them, the trade association that steers its course away from monopolies or restraints which deprive others of a fair opportunity are in no danger.

The trade association has at its command today such a wealth of information from the fields of science, industry and commerce that its function to digest this material and pass it on to its members and to make use of it for the advance of its line makes anything I have said unnecessary as proof of the stability of its position in industrial progress. It is the human instrumentality of our commercial evolution along right lines if intelligently directed.

REPORT OF THE TARIFF COMMITTEE

The Tariff Committee of the American Paper and Pulp Association has completed the work for which it was originally called to perform.

The Tariff Act of 1922, after much delay, was finally passed by Congress and approved by the President.

In the preparation of the paper schedules your committee, aided by other manufacturers, took an active part and believe that while there may be some dissatisfaction on the part of some manufacturers, the schedules as finally embodied in the law are reasonably fair and satisfactory, and provide a more adequate protection to the industry than was afforded by the previous law.

With business conditions in Europe returning to a more settled basis, the apparent advantage enjoyed by the foreign manufacturer will continue to disappear and coincident with that the American manufacturer should receive a corresponding benefit.

The secretary of the association has emphasized a number of times the advantage to the industry of having in the association a man who might be called a customs expert. This man, who should know paper thoroughly and be fairly familiar with import and export problems, could keep in close touch with the larger ports of entry to see that paper is not being brought in and wrongly classified and undervalued. The secretary is correct in his feeling that whenever paper is brought in from the outside and entered under wrong classification and undervalued that it injures the entire industry. It would be very difficult to estimate the amount of paper brought into the country in any one year which is both wrongly classified

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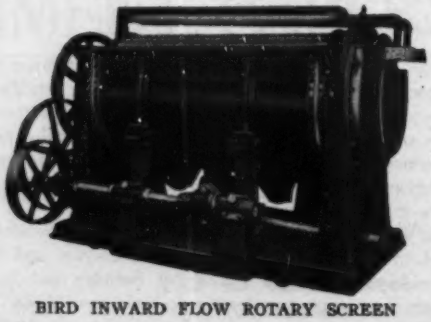

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and undervalued. You were doubtless familiar with the efforts of the Government to secure from importers a number of thousand dollars additional fees upon paper which the Government is now convinced was undervalued.

Such a customs expert as described by the secretary could not only be very helpful to the members of the various associations by protecting them against foreign papers wrongly classified and undervalued, but it would be comparatively easy for this same man to keep in very close touch with the importation of pulp into the country. Such a contact with the pulp situation would allow the association to give accurate figures on total amounts of pulp of different grades being brought in from week to week, or month to month, and it should be possible for such a man to secure accurate figures as to the amount of pulp held in storage at the different ports. There is no question as to the value of such information to the members of this association.

Your committee has not gone into this matter thoroughly and, of course, has no recommendation to make. We are quite sure, however, that the secretary has investigated the matter carefully and we urge that he follow up this development and be prepared to lay a definite suggestion before the various affiliated associations and finally before the executive committee of this association. If the industry is being injured by the bringing in of paper, wrongly classified and undervalued, or by a lack of knowledge as to the foreign pulp situation, then it is entirely in place for the American Paper and Pulp Association to present the need and to keep preventing it until action is taken that will allow the association to give the service which it should give in keeping the membership informed and in protecting them from activities that make it more difficult to do business.

Your committee in co-operation with the committee of the association on the Department of Commerce has urged through the secretary of the association that the Tariff Commission of the United States should employ a man who understands paper thoroughly to handle their paper activities. At the present time paper is grouped with lumber in the Tariff Commission. The industry was misrepresented enough during the war when a similar grouping took place and we believe that the secretary should follow this matter aggressively to see if in time the Tariff Commission will not put on a paper expert to handle paper matters. After all, this representation of an industry in such an organization as the Tariff Commission depends largely upon the interest and the work of the industry itself. We feel that the paper industry has been misrepresented enough in Washington and we commend every effort which the association can make in clearing up this misrepresentation so that the industry may be known there for its accomplishments and for what it can do in serving the public and the Government as a fundamental industry.

As the purposes for which your committee was formed have been accomplished, and as there appears to be no reason for its continuance, we suggest that the present committee be formally discharged to be reformed in the future should the necessity arise.

HENRY W. STOKES, Chairman.

REPORT OF FORESTRY COMMITTEE

The following report was presented for the Forestry Committee by George W. Sisson Jr., chairman.

Our association would be remiss in its duty to the industry, and indeed to the public interest, did it not give serious and studious attention to the problem of a dependable raw material supply to perpetuate the paper industry in the United States.

Wood fibers of many species are now utilized and, by new processes and adaptions, we are gradually widening the opportunities for their practical use. There is much to be done in this direction and it will prove of distinct help in our raw material problem.

The pulpwood supply of the United States is strictly limited, particularly as to that available for the mills in the East. Already we import from Canada about one-sixth of our pulpwood requirements and at least one-fifth of our wood pulp. Relatively few of our pulp and paper companies are independent as to their pulpwood supply. Many of them are purchasing more and more extensive timber holdings both in the United States and Canada.

In view of our own situation, conditions in Canada as to the growth of the industry there and its relation to Canadian pulpwood resources, hold great interest for us. As late as 1910, the total Canadian production of paper of all kinds did not exceed one-quarter of a million tons while in 1920 it reached nearly one and one-quarter millions tons. The increase in production of news print in Canada has been especially startling. As recently as 1915 Canada produced less than half a million tons of news print while in 1922 her production was well over one million tons, of which, by the way, 82 per cent found a market in the United States. The most natural result of this great increase in consumption of pulpwood in Canada has been a growing concern on her part as to her own future in raw material supply for the industry. This resulted *first* in prohibition of export of Crownland wood and *latterly* in suggestion of an embargo or prohibition of export of freehold wood also. I cannot believe that the latter suggestion is seriously entertained by men of large affairs in Canada, as it appears to be carrying to an unreasonable extreme the idea of locking up National Resources against neighbors upon whom they are as surely dependent for favorable markets as are those neighbors for the wood.

Canada is receiving anually from the United States about four million tons of anthracite coal and from ten to fifteen million tons of bituminous coal, both valuable natural resources which are not replaceable as is timber growth. This feature should have, and I believe will have, proper consideration by both countries.

We are glad that our neighbors to the north are in so strong a position as to the production and sale of pulp and paper. The United States, by its policy of an open market to them, has provided a factor as essential to success as are natural resources. Indeed, the entire North American continent should be viewed as a single unit in this great industry. With these two countries lie the possibilities that make for completeness in the industry; forest resources, fuel supply, managerial and engineering capacity, and lastly, a market for the product which is as essential a factor in industrial success as any other of those mentioned, and without which, natural resources could not be profitably utilized. Approached in this spirit on both sides, our economic problems will find a mutually satisfactory solution.

In view of all this, the necessity for early action on the part of the United States in adopting a practical and effective forest program, is clearly indicated.

Three and a half years ago the Forest Conservation Committee of the American Paper and Pulp Association made a concise, but comprehensive report upon the necessity for the practice of forestry upon the timberlands of the Northeastern states if the pulp and paper industry is to be a permanent one in that region, and also announced its belief in a policy of co-operation between the federal and state authorities and timberland owners in working out the solution of this most vital problem.

This statement of policy was given unanimous approval by the association, and was a further and more detailed statement of the same character at the annual meeting just three years ago, the committee being authorized to co-operate with all the other individuals and agencies who might be working in the same direction for the accomplishment of the same purpose. The result was the organization of the National Forestry Program Committee, representing a nation-wide diversity of interest. A member of your committee is the Chairman of this National Committee.

Proposed legislation, based upon the co-operative principle, has been before the House of Representatives for the last two years. The most extensive and carefully prepared hearings ever held upon any forestry measure introduced into Congress have been had upon our bills. The result has been a greatly increased public interest

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and understanding of the necessity for immediate steps for the better preservation and utilization of our timber supply, and especially the realization by members of Congress that action can no longer delayed.

Federal appropriations for co-operation with the states in fire prevention have been materially increased since our efforts began. The policy of purchasing mountain land in the eastern states for National forests has been sustained and appropriations made therefore in the face of drastic cuts in many lines of governmental expenditure. A general law authorizing exchanges of National forest land or timber for privately owned land within the boundaries of the National forests and thus permitting the blocking up of both the privately and publicly owned holdings for better administration went into effect a year ago. All these items were a part of the original proposed legislation and were supported by your Committee.

We have thus far asked for hearings only by the Committee on Agriculture of the House. A special committee on reforestation consisting of five prominent members of the United States Senate was created in January, and this committee has already held extensive hearings in Washington and the South. It will hold hearings in the West during the summer and in New England early in the fall. The committee consists of Senators McNary of Oregon, Moses of New Hampshire, Couzens of Michigan, Harrison of Mississippi and Fletcher of Florida. It is taking hold of the work in very earnest fashion and a report which will stimulate action is looked for when Congress reconvenes in December.

Three years ago there was a great deal of talk in favor of arbitrary bureaucratic control from Washington of the cutting of timber upon private lands throughout the country. Today it is generally conceded that such a measure, if passed, would be unconstitutional, and, still further, that were it constitutional the desired results could not be secured.

Timber will not be grown upon privately owned lands (and this is three-quarters of the timberland of the United States) unless fire prevention, taxation and market returns are such that it is safe and profitable for capital to embark in the enterprise.

The remedy for timber shortage is to grow more timber, not to drive present capital out of the forest industry.

It is most gratifying that the President of the United States both in his annual message to Congress last December and again in his letter to Representative Clarke of this State on January 24th of this year definitly approved the plan of co-operation which our Committee has stood for from the first. In the latter statement the President said:

"I am very glad, therefore, that the Committee on Agriculture feels that we have come to a time when definite provision should be made for larger co-operation between the Federal Government, the States and the private owners, with a view to working out a National policy covering the growth, protection, conservation and use of timber."

We have now the best opportunity that has ever existed to secure both National and state legislation of a character that will make possible the maintenance of our timber supply. Your committee asks every member of the American Paper and Pulp Association to stand squarely behind its back and hold up its hands in every effort that may be made in this direction.

WHAT THE WOODLANDS SECTION IS DOING

The following report was made, in part, by C. W. Hurtubis, chairman of the Woodlands Committee before the American Pulp and Paper Association, Thursday morning in the Astor Gallery.

The Woodlands Section was formed in Chicago in 1920 at the November meeting of the American Pulp and Paper Association, the intention being to form an organization which would bring to its support every man connected with the paper and pulp industry who was interested in and could help in the development of new ideas and methods for dealing with the fundamental resources of the industry.

Virtually, the purposes of the association were to increase the efficiency of the woods operations of the industry, to encourage the practice of forestry on timber holdings and to provide a medium for the gathering and dissemination of information which will promote the permanency of woods operations of the pulp and paper industry.

Since the forming of the Section, which was started with a membership of about sixty, regular meetings have been held each successive year in the spring and fall and we have also had two or three regional group meetings for the consideration of problems peculiar and pertinent to that particular region in which it was held.

Some of the problems that have been thoroughly investigated and discussed at the different conferences included: Use of tractors, Forest mapping and surveys in connection with management of timberlands and the problem of their taxation, Slash disposal, Mortality and yields of pulpwood species, Commercial value of reforestation, Drainage areas adjoining the Lake states, Successful reforestation by pulp and paper companies, Budworm infestation vs. pulpwood production, Intensive local fire protection, Conservation of pulpwood supply and standardization of pulpwood specifications, Cost systems for logging operations.

Information and statistics concerning all of these problems have been compiled by O. M. Porter, the secretary-treasurer of the Woodlands Section and can be obtained from him. In addition to the topics outlined Mr. Porter is also constantly in touch with the National Research Council of Washington, D. C., and with the American Society of Mechanical Engineers, regarding developments in the application of power to woods operation as applied to the industry. We are also co-operating, in so far as possible with the Canadian Woodlands Section and have a joint committee which is working constantly to our mutual benefit.

Our observations over the last few years seem to show that the paper industry is reluctant to realize its dependence upon the pulpwood forests of the United States and the rapidity with which these forests are being depleted by being cut-over and burned; and furthermore, that the present available timber, either regional or otherwise cannot be applied for paper making purposes only.

We are fortunate, gentlemen, in having a very efficient forester-secretary. We have observed the tremendous amount of good for the pulp and paper industry, which has been accomplished during the past two years and this will be continued, provided we are financially able to keep our secretary in close touch with forestry operations in the field from three to six months of the year. It may be noted that the Canadian Woodlands Section is given an amount, something like $10,000 so that they will be able to employ a Forester Secretary for the above purposes.

In closing, permit me to say that the Woodlands Section is very desirous of having the industry make use of the facilities it has to offer and to increase its membership for effective service for the entire industry.

REPORT OF ADVISORY COMMITTEE

The following report from the Advisory Committee of the American Paper and Pulp Association in its relation with the Paper Section of the Bureau of Standards by A. H. Nevius, chairman:

This committee was appointed January 4, 1921, by the president of our association in response to a request from the Bureau of Standards for the appointment of a committee to advise with them as to the needs of our industry in so far as the solutions of scientific problems, relating to production and the testing of paper, are concerned.

Several meetings were held in Washington during 1921 and 1922. In August, 1921, the committee discussed a program for the study of the standardization of paper with representatives of the Paper

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Section of the Bureau of Standards, the printers and paper merchants.

By July, 1922, we found it advisable to increase the personnel of the committee so as to have representatives act as chairmen of sub-committees appointed to handle data related to each of the 10 groups into which the industry had been divided. These appointments were promptly made and accepted.

At this July meeting, the Paper Section submitted certain classifications, definitions and technical problems for our consideration. These were referred to the several sub-committees, and at a meeting in Washington on September 25, partial reports from these committees were read and discussed. Complete reports from our sub-committees have now been filed with our secretary, and are being edited for publication.

These reports have been very carefully and thoughtfully worked out and we believe will be of very great help to the Bureau of Standards in its work for the paper industry. The sub-committee men have taken their tasks seriously and are to be congratulated on the character of comprehensiveness of their reports.

The committee has accomplished the following:

1. Has become familiar with the facilities of the Paper Section for research problems that have and will benefit the paper industry.

2. Has assisted in determining what problems of paper production and testing could be investigated by the Paper Section to the greatest advantage of the industry.

3. Has co-operated very closely with the Paper Section of the Bureau and supplied samples of paper and voluminous data in connection with the development of a method for measuring the color of paper, and in a study of clay retention.

4. Has adopted and recommended the report of the Technical Committee of the Bureau of Standards (published in the PAPER TRADE JOURNAL, September 14, 1922) in regard to the sampling and testing of paper, tolerances to be applied to test date, and the standard basis of weight, 25 x 40—500, for all grades of paper.

5. Has advised in regard to the program of the simplification of the sizes of paper.

6. Has made comprehensive reports containing definite recommendations in regard to the classification and definition for the 10 main classes of paper and their sub-division.

In view of these facts we believe that an Advisory Committee should be maintained by our association for conference with the Bureau of Standards and that this committee should take an active part in the work of the Paper Section and help whenever possible with its practical and moral support.

In submitting this report I beg leave to mention the personnel of the committee as follows, thanking them for the earnest support given to this work, and also to O. M. Porter, secretary of this committee:

Fred C. Clark, Pejepscot Paper Company, Brunswick, Me.

H. W. Ellerson, Albemarle Paper Manufacturing Company, Richmond, Va.

H. E. Fletcher, Fletcher Paper Company, Alpena, Mich.

Geo. A. Galliver, American Writing Paper Company, Holyoke, Mass.

Alexander Gilman, Allied Paper Mills, Kalamazoo, Mich.

C. A. Gordon, Oxford Paper Company, New York City.

R. S. Hatch, Hanersley Manufacturing Company, Garfield, N. J.

Norman Harrower, Linton Bros. & Co., Fitchburg, Mass.

R. Frank McElwain, Crocker-McElwain Company, Holyoke, Mass.

Ernst Mahler, Kimberly-Clark Company, Neenah, Wis.

M. E. Marcuse, Bedford Pulp and Paper Company, Richmond, Va.

C. E. Nelson, Mac-Sim-Bar Paper Company, Otsego, Mich.

J. C. Schmidt; Schmidt & Ault Paper Company, York, Pa.

D. A. Smith, D. of C. Paper Manufacturing Company, Washington, D. C.

Frank L. Stevens, Stevens & Thompson Paper Company, North Hoosick, N. Y.

H. W. Stuart, The U. S. Paper Goods Company, Cincinnati, O.

F. E. Taylor, Taylor-Logan Company, Holyoke, Mass.

W. J. Raybold, president, American Paper and Pulp Association.

Dr. H. P. Baker, secretary, American Paper and Pulp Association.

TECHNICAL ASSOCIATION REPORT

George E. Williamson made the following report on the work of the Technical Association of the Pulp and Paper Trade Industry for the past year:

The outstanding feature of the year's activities of the Technical Association has been the formulation of a definite policy of work.

In order to render the greatest service to the pulp and paper industry the association's executive committee has realized that definite objectives must be determined upon, and projects developed leading to the attainment of these objectives.

The first objective undertaken was "Waste in the Industry." Particular phases of this very broad subject were selected for development, as follows:

Utilization of Barking Drum Waste.

Waste in Mill Effluents.

Broke Losses.

The efforts of special committees have been concentrated upon these projects during the year and much valuable information has been collected and disseminated.

The fall meeting in Detroit last October spent the greater part of the time upon these projects.

Progress on the text books has been continued without interruption.

The actual use of the books has been begun in earnest. During the year, both in this country and in Canada, class instruction is carried on by numerous mills.

Facilities for class study are available through the University Extension Division of the University of Wisconsin, the Division of University Extension of the State of Massachusetts, and the Institute of Industrial and Domestic Arts of Canada.

Special mention should be made of the latest evidence of support of the project by the Canadian Pulp and Paper Association which appropriated $5,000 at its annual meeting in January.

The Technical Association is carrying on several lines of co-operative work with other organizations. Among these may be mentioned:

A joint committee on paper mill felts, comprised of representatives of the paper and felt industries.

A like joint committee on Fourdrinier wires.

The joint committee on Vocational Education with representatives of the Technical Association and the Technical Section of the Canadian Pulp and Paper Association.

The advisory committee to the Paper Section of the Bureau of Standards.

The development of definite standards for use in paper specifications is proceeding as rapidly as conditions will permit.

It has been the aim of the officers of the association to co-operate as closely as possible with the parent association, and the advice, assistance and general approval of the work under way by Mr. Raybold and Dr. Baker has been most gratifying.

I want to call to your attention the very satisfactory arrangements for the publication of Technical Association material by the PAPER TRADE JOURNAL.

The Technical Section, under the editorship of our secretary, Mr. W. G. MacNaughton, has proved to be a valuable addition to the literature of the pulp and paper industry.

We are glad to note the establishment of a similar section by the Cost Association.

Probably the most important service which the Technical Associa-

E. W. KIEFER—President
C. C. PECK—Treasurer

CARL BONNING—1st Vice President
E. A. HAYNES—2nd Vice President

J. P. DURAND—Sec'y and Asst. Treas.

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tion can render the pulp and paper industry results from the work of standing and special committees.

I have already touched upon some of the work of special committees, but in addition want to assure you that the standing committees are continuing their allotted tasks without interruption, and each year witnesses additions to the knowledge of the technical and practical sides of the art of pulp and paper making.

REPORT OF COST ASSOCIATION

The following report regarding the work of the Cost Association was made by President C. A. Jasperson. While this organization is doing work which indirectly benefits every pulp and paper manufacturer in the United States, its financial support is coming only from a group of broadminded executives who realize the necessity for such educational work in the industry if it is to be placed on a sound, economic basis. Service is given to the industry as a whole irrespective of membership in the association, and, in fact, all inquiries relating to accounting subjects or Federal taxes, rehandled by our Secretary-Treasurer, who acts as an honorary assistant Secretary for the association, without pay.

Since this work is fundamental, it should be of interest to every manufacturer. It affects your selling prices and consequently, your profits. Selling prices should be predicated on correctly calculated manufacturing costs, but the successful application of the principle of basing selling prices on costs depends upon its general observance by all manufacturers

We do not hesitate to say that if it were possible at this convention to convince every manufacturer of pulp and paper that selling prices should only be based on cost and that extreme care should be taken to get correct costs, the result to the industry, as a whole, would be astounding.

Now that business is improving, the time has come to guard against future losses by seeing to it that your cost department is functioning correctly and effectively. We cannot guard against poor business, but we can guard against big losses. Nobody is obliged to sell paper below cost. If nobody did it wouldn't be done. One starts, and the rest follow; that is, unless on receipt of reliable information from their cost departments they decide they are *not* in business to make paper, but to make money, which cannot be done by making and selling paper at a loss. There is no real necessity to do this, in spite of the arguments advanced regarding the necessity for holding customers. Customers can be convinced by means of a clear statement of facts regarding costs. They, too, have to sell paper, and know that what they gain when they buy it below cost will have to be made up later when prices rise. This is bad business, because what industry wants is stabilization of selling prices, which can only be brought about legally by a determination on the part of manufacturers that they will not sell below cost, nor boost prices in good times to make up losses incurred in times of depression.

The point at once arises in the mind, what is cost? Each manufacturer must determine this for himself, but the group as a whole may agree to use some methods in determining their costs, provided, of course, that these methods do not include any so-called "fixed" costs. In other words, the cost system decided upon by the group must be based upon correct cost accounting principles.

Enough has been said to clearly indicate the importance of the Cost Association's work to the industry as a whole, and the officers and Executive Committee therefore confidently appeal to manufacturers in all groups within the industry to give the Association their moral and financial support, thereby making it possible for them to

1. Reach every manufacturer with their message.
2. Convince him of the importance of this message both to himself and the industry as a whole.
3. Make cost investigations in every group for the purpose of:
   (a) Collecting reliable cost data to be used in
   (b) Determining the best cost methods to be adopted as standard by the whole group.
4. Arrange for regular meetings of cost men in each paper making center for the purpose of discussing matters of general interest to them.
5. Facilitate the installation of the cost methods adopted, by acting in an advisory capacity to executives in connection with their contract with public accountants doing this work.
6. Study all legal decisions having reference to the adoption of standard or uniform cost systems by groups of manufacturers and cooperate with the Government departments interested in such activities, and thus supply manufacturers with the best possible advice on these matters.

REPORT FROM SALESMEN

H. H. Reynolds of the B. D. Rising Paper Company, president of the Salesmen's Association of the Paper Industry, spoke of the activities being carried on by the members of his organization, both as regards their own interests and as regards their connection with the industry.

The high standards of integrity which are held, the general good feeling that exists and the concrete accomplishments through mutual interchange of ideas, has placed the Salesmen's Association on a very firm and lasting basis, Mr. Reynolds said. He recalled various meetings that have been held throughout the year in various localities, notably those at New York, Chicago, Boston and Springfield, and spoke of their increasing popularity.

Although the organization has grown steadily during the past year, there is still a need for an increased membership, according to Mr. Reynolds, who declared that any salesmen who desired a standing in the trade could not afford to refrain from belonging to the Salesmen's Association.

REPORT FROM SUPERINTENDENTS

Speaking for the American Pulp and Paper Mill Superintendents' Association, C. E. Nicely, of the LaSalle Paper Company, South Bend, Ind., its president, described in a brief manner the general plan of meetings which is now being carried on.

Beside the regular district meetings, which have featured the affairs of the superintendents for some time, there have lately been inaugurated a series of smaller group meetings, Mr. Lacey said. These meetings will doubtless be continued in the future as the new policy has met with great approval in all sections.

The good will and cooperation which his organization has met with at the hands of the officers of the American Pulp and Paper Association has been a matter of much satisfaction, he said, observing that this spirit of cooperation seemed to pervade the entire industry.

MEETING OF SALESMEN'S ASSOCIATION

The growing popularity and strength of the Salesmen's Association was attested to on Tuesday, when the largest number who have ever attended any affairs of the organization were present and took part in each feature of a splendid all-day program.

Convening in the East Room of the Waldorf-Astoria at 10 o'clock in the morning, the association listened to a very fine address by the president, H. H. Reynolds. President Reynolds reviewed the work of the past year and spoke of the bright future ahead for the organization.

Members of the association listened with close attention to the annual report of the secretary-treasurer, Dr. Hugh P. Baker, who declared that the Salesmen's Association had come to be a recognized factor in the paper industry and that largely through its efforts must come sales promotion, not only in this country but in foreign lands.

Dr. Baker told of the constant progress made during the past year, mentioning the regular luncheons which have been held by the various groups in Chicago, New York and Boston. He recalled the fact that though there had been some losses in membership the

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size of the organization had yet continued to increase, with new applications constantly coming in. "I feel that we are just now ready for an aggressive membership campaign that will make our association gradually representative of the salesmen of the industry," said he.

"Constructive work has been done by the association in the luncheons and dinners already referred to. There must, however, be more constructive work if the association is to function as we all believe that it must function in the industry. In a way we lack the opportunities for constructive work, which have been seized upon and used advantageously by the Technical and Superintendents' associations. Their problems are more definite, and the results of their work can be made more apparent to the executives of the industry. Nevertheless, there is work that can be done by our association to the very great advantage of the industry."

Dr. Baker briefly outlined measures for the organization, both in strengthening the individual membership and in carrying on a campaign to increase and popularize the use of paper. He closed his talk with a plea to each member to take a personal part in constructive work which would be for the upbuilding of the industry.

A splendid and scholarly paper on "Recent Developments in the Paper Industry" was given by Dr. Warren M. Persons, Harvard Committee on Economic Research.

Declaring that "Service has taken the sandbag stigma from salesmanship and lifted it to the high plane of business practice," Lawrence W. Rogers, of New York University, gave a very fine talk on "The Service Factor in Salesmanship." He showed how a good salesman can be of real service both to his house and to his customers and advised them to study themselves as well as their commodity. "Whatever you do, don't be a side streeter," he said in conclusion. "Make up your mind to get the biggest share of the sales, your animating principle."

F. J. Ross, of the F. J. Ross Company, spoke on "Advertising An Industry," and J. L. Fearing, chairman of the Chicago division of the association, spoke on "What's Ahead for the Salesmen's Association?"

Officers elected for the ensuing year were:

President, J. I. Fearing, International Paper Company, Chicago; vice-president for New England District, Walter Perry, Chemical Paper Company, Holyoke, Mass.; vice-president for New York District, R. D. W. Ewing, American Writing Paper Company, New York; vice-president for Chicago District, Ray Russell, Marathon Paper Company, Chicago; vice-president for Miami Valley District, Robert R. Houk, Jr., Dayton, Ohio.

U. S. PULP PRODUCERS' ASSOCIATION

Since changing its name from the Pulp Manufacturers' Association, altering its policies and broadening the scope of its activities, the U. S. Pulp Producers' Association has greatly increased its membership, according to O. M. Porter, secretary of the association. "In previous years we have had but eight or ten at our annual luncheons," he said, "whereas this year we have a whole roomful, or about thirty-five to forty present at the meeting."

Following the secretary-treasurer's report, at the luncheon held in Room 112 of the Waldorf at 1:00 p. m. Tuesday, the following officers were elected to serve for the ensuing year: president, D. C. Everest, of the Marathon Paper Mills Company, Rothschild, Wis.; first vice-president, L. M. Alexander, of the Nekoosa-Edwards Paper Company, Port Edwards, Wis.; second vice-president, E. W. Kiefer, of the Port Huron Sulphite and Paper Company, Port Huron, Mich.; third vice-president, W. H. Savery, of Harpers Ferry Paper Company, Harpers Ferry, West Va.; secretary-treasurer, O. M. Porter, 18 East 41st steet, New York; executive committee, Herman Elsas, of the Continental Paper and Bag Mills, New York; George W. Sisson, Jr., of the Racquette River Paper Company, Potsdam, N. Y.; and Col. A. C. Goodyear, of the Bogalusa Paper Company, Inc., Marine Trust Bldg., Buffalo, N. Y.

WRITING PAPER ASSOCIATION

The meeting of the Writing Paper Manufacturers' Association was called to order at 10 o'clock Wednesday morning in the East Room of the Waldorf, and following the report of E. H. Naylor, secretary-treasurer of the association, a discussion of problems which arose in the course of the past year took place.

In the election which followed, these officers and members of the executive committee were chosen for the coming year: President, N. W. Wilson, of the Hammermill Paper Company, Erie, Pa.; first vice-president, W. M. Crane, Jr., of Crane & Co., Dalton, Mass.; second vice-president, F. A. Leahy, of the Eastern Manufacturing Company, New York; secretary-treasurer, E. H. Naylor, of 18 East 41st street, New York; executive committee, N. W. Wilson, of the Hammermill Paper Company, Erie, Pa.; W. M. Crane, Jr., of Crane & Co., Dalton, Mass.; W. D. Judd, of the Carew Manufacturing Company, South Hadley Falls, Mass.; F. A. Leahy, of the Eastern Manufacturing Company, New York; H. A. Moses, of the Strathmore Paper Company, Mittineague, Mass.; E. A. Oberweiser, of the Whiting-Plover Paper Company, of Stevens Point, Wis.; and S. L. Willson, of the American Writing Paper Company, Holyoke, Mass.

N. W. Wilson, the president, was chosen to serve as a member of the executive committee of the American Paper and Pulp Association.

TISSUE PAPER MANUFACTURERS' ASSOCIATION

The annual meeting of the Tissue Paper Manufacturers' Association was held in Room 110 at the Waldorf at 10 o'clock on Tuesday morning. Problems that have arisen in the industry during the past year were discussed and the reports of the various officers were heard.

In the election of officers, which followed immediately, the following men were chosen to serve for the year 1923-1924: President, John Brannon, North End Paper Company, Fulton, N. Y.; vice-president, J. M. Ross, Sauquoit Toilet Paper Company, New Hartford, N. Y.; secretary-treasurer, E. H. Naylor, 18 East 41st street, New York City; executive committee, John Brannon, North End Paper Company, Fulton, N. Y.; A. D. Coffin, C. H. Dexter & Sons, Inc., Windsor Locks, Conn.; W. L. Heath, West Milton Paper Company, New York City; L. C. Jeffress, Wortendyke Manufacturing Company, Richmond, Va., and J. M. Ross, Sauquoit Toilet Paper Company, New Hartford, N. Y.; member of executive committee of the American Paper and Pulp Association, John Brannon.

WRAPPING PAPER MFRS.' SERVICE BUREAU

Two meetings of the Wrapping Paper Manufacturers' Service Bureau were held Wednesday April 11 at the Waldorf, the former at 10:30 a. m. at the Tea Lounge on the Roof Garden of the hotel, and the latter at 2:00 p. m. Owing to the fact that the Wrapping Paper Manufacturers' Service Bureau does not hold its annual meeting during the Spring Convention week, these sessions were confined to discussion of internal affairs of the bureau, no officers being elected at this period.

BOOK PAPER MANUFACTURERS' ASSOCIATION

The Book Paper Manufacturers' Association at its meeting in the East Room of the Waldorf at 2 p. m. on Monday voted to dissolve and to turn over all its records to the Book Paper Converters' Association. The change was decided upon in view of the fact that the Book Paper Manufacturers' Association represented only about 40 per cent of the industry, while the converters' association represents nearly 90 per cent. The change is more or less of a change of name to make the organization more specific, as most of the mills in the old organization will continue in the newly formed association. The permanent name of the new association has not yet been decided, but details of organization will be taken up at another

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meeting to be held May 3, either in the West or the East. Until that meeting the statistical work will be continued, in order not to break the continuity of production and other records, by E. H. Naylor, who has been secretary of the old Book Paper Manufacturers' Association.

Alexander W. Gilman, of the Allied Mills of Kalamazoo, is president of the new organization, but other officers have not been selected.

WOODLANDS SECTION

The Woodlands Section met in Room 115 in the Waldorf and every minute was occupied with talks and discussions of real value to those who attended.

The report of O. M. Porter, the secretary-treasurer, involved several important points. In the main it dealt with the incorporation of several new projects, practically all of which were received with favor by those attending the meeting and will subsequently be carried out. These involve a more detailed study of pulpwood conditions on this continent, forest management for continuous production, survey of the damage done by rot, a study of methods of scaling and culling, the utilization of birch and poplar for various purposes in the industry and a study of fire protection, especially in regard to what cooperation may be expected from the various state and national governments.

Note is made in the report of the various companies in the United States and Canada which have cooperated in compiling information as regards tractors and transportations, logging methods and machinery, forest management and reforestation.

Briefly, Mr. Porter's report shows definite and comprehensive data on practically every subject in which the Woodlands Section is interested and the present condition of the organization augurs well for its continued success and value to the pulp and paper industry.

The report and recommendations of the Forestry Committee are indicatory of much research and investigation on the part of the members of the committee and the sub-committees, especially of the New York sub-committee. In general, the report establishes beyond question the crying need for manufacturers to consider the problem of the ever-decreasing supply of wood. The sub-committees are unanimous in their belief that only by the employment of trained foresters can concrete and valuable work be done.

The New York sub-committee offers a plan for the growth study which cannot be but of great value wherever it is utilized. The study to be of lasting value, of course, must be followed up in some way and the New York group suggests the general adoption of cutting regulations, giving a simple working plan for their application.

That the spruce bud worm is doing more damage to the pulp wood forests of North American than all of the cutting by the paper companies was pointed out by C. W. Boyce, of the United States Forest Service. Quoting Chief Forester Piche, of the Province of Quebec, as an authority for the estimate of the loss of 75,000,000 cords of pulp wood in the last ten years, he said this comes within 50 per cent of the entire amount of wood used by the paper industry of North America since the beginning. It was also pointed out that the heaviest portion of this damage was in the three years ending in 1920. At a minimum estimate of $15 per cord, the financial loss due to this insect would total over a billion dollars. The losses in other portions of the northeastern states and provinces add hundreds of millions of dollars of losses to this huge figure.

That the weighing of wood in pulp manufacture has three prolonged advantages was the statement of B. S. Summers of the Port Huron Sulphite and Paper Company, Port Huron, Mich., before the afternoon meeting of the section. These advantages, he said, were: First, a good indication of the quality of the wood purchased; second, location of the chief loss in manufacturing as between departments, and, third, the stimulation of research and efficiency of management to save losses.

Mr. Summers reviewed a series of experiments conducted by his company, with the results obtained, and showed that the weighing of wood would make a large saving of material possible, through locating losses otherwise indefinite as between departments.

In referring to measurements, he said that it was found that a cord of rough wood varied from 3,065 to 5.570 pounds, the former being wood three or four years old, containing 18 to 20 per cent moisture, and showing signs of decay, while the latter figure was watersoaked wood running from 40 to 50 per cent water, and sound. These figures refer to spruce, with a sprinkling of balsam.

"It will probably be sufficient for the present," he said, "to state that sound Canadian spruce, heavily watered, will frequently run over 5,000 pounds to the cord."

He pointed out that the tests soon showed that the number of logs making up a cord was an important factor in the barking loss. The tests effected a saving by pointing out how machinery could be adjusted to reduce the barking loss. Other losses were similarly averted by the information developed from the weighing of the wood.

Advances that have been made in the use of the aeroplane in forest fire control, forest mapping and reconnaissance, were able discussed by Ellwood Wilson, of the Laurentide Company, Ltd., Canada. Mr. Wilson, who has done much practical work in this field, illustrated his talk with lantern slides. He showed by pictures and verbal argument that the aeroplane has a really practical value to the owner of extensive forest tracts.

Officers were elected for the year 1923-1924 as follows: Chairman, C. W. Hurtibus; first vice-chairman, George Ostrander; second vice-chairman, John E. Alexander; executive committee, D. E. Landerburn, M. T. McBane and E. S. Bryant.

REPORT OF RESOLUTIONS COMMITTEE

The committee on resolutions presented the following report:

WHEREAS, the paper industry is one of America's basic industries, and

WHEREAS, paper is a vital requirement of every line of every business, therefore, be it

RESOLVED, That the American Paper and Pulp Association assembled in its forty-sixth annual convention expresses its attitude toward national problems and problems of the paper industry as follows:

1. The Association approves a budget system for the government and that the Government should live within its income.

2. The Association favors strengthening the United States Tariff Commission if possible, making it a non-partisan and permanent body of experts, serving every industry and the public in a fair and effective way.

3. The Association favors more effective support by the Government of research work at the Bureau of Standards and at the United States Forest Products Laboratory particularly along lines of value to the paper industry.

4. The Association urges better support of the activities of the U. S. Department of Commerce and especially of the Bureau of Foreign and Domestic Commerce.

5. The Association believes in closer cooperation between all associations in the paper industry, with clearer lines of demarkation between the activities of the central and affiliated associations; elimination of duplication and better support of association work generally.

6. There should be more active participation of associations in foreign trade activities.

7. The Association urges support by paper manufacturers of the U. S. Chamber of Commerce. Every manufacturer should be an individual member, as the Chamber is the one big business men's organization of the country representing business at Washington.

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8. Inasmuch as the capital invested in the pulp and paper industry is very large in comparison with the annual turnover, which makes it essential that a fair margin of profit should be obtained on all sales if the industry is to be placed on a sound economic basis, all manufacturers are urged to adopt the policy of basing their selling prices on correctly determined costs and to give their moral and financial support to the Cost Association of the Paper Industry, which is working to promote the use of correct cost methods within the industry.

9. As better knowledge and practice is fundamental in the development of right manufacturing methods, we believe stronger support should be given the Technical Association of the Pulp and Paper Industry, the American Pulp and Paper Mills Superintendents' Association and the Woodlands Section of this Association.

10. That the Salesmen's Association of the Paper Industry deserves the support of the entire industry, because it stands for sound progressive salesmanship, trade expansion based on facts and business confidence.

GUMMED PAPER ASSOCIATION

That an advertising campaign to promote the use of gummed tape is already under way, was the announcement made at the meeting of the Gummed Paper Manufacturers' Association at 10:00 a. m. Tuesday in Room 107 of the Waldorf. The campaign is a part of the decision of the association to work for the general recognition of fixed standards of quality for gummed tape and the members of the association have adopted a trademark which will serve as a guarantee that the tape sold by the members is up to the approved standards of strength and quality.

Shortly after the report of the Secretary-Treasurer, Jacob Erichsen, an election of officers was held and the following men were chosen to serve for the ensuing year: president, C. H. Crowell of the Crowell Corporation, Brooklyn, N. Y.; vice-president, Phillips Kimball of the Liberty Paper Company, New York; and secretary-treasurer, Jacob Erichsen.

COVER PAPER MANUFACTURERS' ASSOCIATION

At a meeting at 2 p. m. Tuesday afternoon in Room 110 of the Waldorf, the Cover Paper Manufacturers' Association discussed items of interest to the association members which have occurred in the course of the past year. Following the secretary-treasurer's report, an election of officers was held, at which these men were selected to serve for the coming year: President, F. E. Taylor, of the Advertisers' Paper Mills, Holyoke, Mass; vice-president, Thomas Beckett, of the Beckett Paper Company, Hamilton, Ohio; secretary-treasurer, E. H. Naylor, of 18 East 41st street, New York; executive committee, F. E. Taylor, Thomas Beckett, and D. L. Quirk, Jr., of the Peninsular Paper Company, Ypsilanti, Mich. F. E. Taylor, the president of the association, was selected to represent the cover paper manufacturers as a member of the executive committee of the American Paper and Pulp Association.

SWEDISH MINISTER HONORED

A notable addition to the program for Paper Week was the giving of a complimentary luncheon on Thursday, April 12, to the Swedish Minister to the United States, Hon. Axel Wallenberg, by W. J. Raybold, president of the American Paper and Pulp Association. The president's luncheon was, in the past, an annual social function of the week, usually attended only by a limited number of leaders in association activities, the discussion being the work of the association for the following year.

This year, however, it assumed an international character, taking the place, in a measure, of the projected evening program of addresses by notable paper manufacturers from Scandinavia. A brief address was made by George W. Sisson, Jr., acknowledging the courtesies extended to himself and Dr. Baker while on their tour of the papermaking countries of Northern Europe last year. To this Minister Wallenberg made an informal response, assuring the assemblage that Sweden appreciated the interest manifested by pulp and paper executives of the United States and sought to foster the closest co-operation between the two countries.

GLAZED AND FANCY PAPER ASSOCIATION

A further continuance of the progressive activities begun during the last year was determined upon at the meeting of the Glazed and Fancy Paper Manufacturers' Association, held at 1:30 p. m. Wednesday in Room 107 of the Waldorf. Among the various matters discussed was the continuance of the work begun last year, looking toward the establishment of uniform cost accounting methods in the mills of the members. In the election of officers, which followed a general round-table discussion the following men were chosen to serve for the ensuing year: president, W. H. Shuart, of the Springfield Glazed Paper Company, Springfield, Mass., and vice-president, N. N. Fowler, of the Hampden Glazed Paper and Card Company.

FOREST INDUSTRIES CLUB

Satisfactory progress in the enrollment of charter members of the Forest Industries Club, was reported by L. B. Steward, acting secretary of the Organization Committee of the club. Mr. Steward spoke before many of the sectional meetings of the Association in the course of the week and was on hand personally in a space opposite the information booth to discuss the proposed organization with interested manufacturers. Booklets showing the plans of the Organization Committee to secure a floor of the new Pershing Square Building, at Forty-second street and Madison avenue, to be used as club rooms, were distributed at the convention.

CARDBOARD MANUFACTURERS' ASSOCIATION

The annual meeting of the Association of Cardboard Manufacturers was held at 10:00 a. m. on Wednesday, April 11, 1923, in Room 107 of the Waldorf and following the report of the association's activities during the course of the past year, a round table discussion of the members ensued. Plans for the succeeding year—1923-1924, were discussed in detail and following this Joseph Lowe of the Fallulah Paper Company of Fitchburg, Mass., was elected president of the association for the term of one year. Shortly following the election the Cardboard Manufacturers' Association adjourned.

VEGETABLE PARCHMENT ASSOCIATION

The meeting of the Vegetable Parchment Manufacturers' Association, previously scheduled to meet in Room 109 of the Waldorf Astoria, was changed to the Hotel McAlpin, where a general round-table discussion of events of interest during the past year was held by the various members. No report of an election of officers was issued by the meeting, and the session was not open to the general public.

WAXED PAPER MANUFACTURERS' ASSOCIATION

Meeting at 10 A. M. in the McAlpin Hotel, the Association of Waxed Paper Manufacturers discussed until nearly 1 o'clock current business problems and matters that arose in the course of the past year.

SETTLEMENT IN SWEDISH PULP STRIKE

According to the Swedish Consul General, official information has been received from its home government on Saturday, April 7, that the strike of pulp workers in that country is now definitely settled. It was also understood that importers in this country received word to the same effect, but as yet the Swedish Cellulose Association has not confirmed reports sent to this country with regard to the breaking up of the lockout. At the time of going to press no further details were available.

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PAPER MAKERS' SAFETY ASSOCIATION MEETS

Two outstanding features were noted in the address of President C. Nelson Gain, of Toronto, at the annual meeting of the Ontario Pulp and Paper Makers' Safety Association held recently at Toronto, Ont. One was the very creditable improvement in accident records and the other was the deeper interest shown in the shield and flag competition.

In the rules governing the accident prevention contest each year in Ontario, the mills are divided into two groups—Class A, those employing two hundred people and up and Class B—those employing less than two hundred. In the first class, the trophies consisting of a silver mounted shield bearing a suitable inscription and a commemorative silk flag were captured by the Provincial Paper Mills, Port Arthur Division, which had 20 non-fatal accidents, involving 336.5 days lost time or 1.75 days lost time per full time worker in the plant. The runner-up in the competition was the Fort Frances Pulp and Paper Company, Fort Frances, with 36 non-fatal accidents, involving 358.5 days lost time or 1.88 days per full time worker.

In Class B, the Provincial Paper Mills, Georgetown Division, carried off the awards, with 3 non-fatal accidents representing 56 days lost time or .875 days per full time worker. The closest competitor was Miller Brothers Company, Limited, of Glen Miller, with 2 non-fatal accidents involving 42 days lost time or 1.17 days per full time worker in the plant. Miller Brothers Company has stood second on the list for two years in succession, which is a rather remarkable record and next year may win out.

The officers of 1922 were re-elected for the coming year as follows: President, C. Nelson Gain, Don Valley Paper Company, Toronto; vice-president, H. F. E. Kent, Kinleith Paper Mills, Toronto; secretary and engineer, A. P. Costigane, Toronto. The directors for 1923 are: George Carruthers, Interlake Tissue Mills Company, Toronto; I. H. Weldon, Provincial Paper Mills Company, Toronto; Col. C. H. L. Jones, Spanish River Pulp and Paper Mills, Saulte Ste. Marie; J. P. Murer, Riordon Company, Hawkesbury; and L. R. Wilson, Abitibi Power and Paper Company, Iroquois Falls, Ont.

CEMENT INDUSTRY BUYS MANY PAPER BAGS

Production of bag paper in 1922 showed a greater increase over the preceding year's output than did any other grade, according to the recently issued report of the Federal Trade Commission. The large gain in this field of over sixty per cent both in production and shipments was doubtless due to a number of causes, among which returning prosperity of business generally was a potent force. The great construction program was not the least important factor in the revival of activity in the bag paper field, for paper sacks are used in shipping a number of building materials. Rope paper and valves in the sacks introduce the element of novelty in the case of these containers.

In the portland cement industry, for example, many millions of paper bags are employed annually in shipping that widely used commodity. While the total demand from this source accounts for only a few per cent of the bag paper production, it is estimated that in 1922 the rather impressive total of 7,000,000 pounds of paper went into the containers for cement alone.

Undoubtedly more paper bags were used last year than in 1921, for the shipments of cement were considerably greater, totaling 116,563,000 barrels. At four sacks to the barrel, this is the equivalent of 466,252,000 sacks. Except for the comparatively small export business, barrels are no longer used in shipping cement; the great bulk of it is shipped in returnable cotton or burlap sacks or in strong paper bags, each holding one cubic foot, or 94 pounds net. At present, by far the most of it is packed in cloth, although paper is very popular in some localities.

Paper making and cement manufacturing are alike in some respects. Each uses great quantities of raw materials, which the manufacturer must secure wherever they happen to be located. Quantity production is essential, yet standards of quality must be strictly adhered to. By a complex manufacturing process, the low grade raw materials employed are turned into a finished product that is highly dependable.

Just as the cement industry draws upon the paper supply, so do the pulp and paper mills turn to concrete, made with cement, for constructing dams to develop hydraulic power and for erecting lasting buildings to house their equipment.

As the plants are already equipped to turn out considerably more cement than was made last year, and in fact have been operating at a much higher rate so far this year than last, the prospect for an increased market for paper bags in the cement industry is excellent.

PHILADELPHIA COARSE PAPER MEN MEET

At the meeting of the executives of all the Philadelphia firms handling wrapping paper and twines held in the Bourse restaurant, W. Parke Weikert presented James L. Loring of Boston, who has been successful in organizing the Paper and Twine Service Corporation of Boston, and the Associated Paper and Twine Merchants of New York and it was he who made the principal address. He pointed out that he had found in both these cities as he had been advised existed in Philadelphia as well, a condition among the coarse paper dealers in their small order trade which he believed made profit impossible and loss almost certain. He advocated the organization of a body which, while it would not in any way restrain trade or compel the adoption of higher prices, or of uniform trade customs, would suggest sales conditions fair alike to dealer and to consumer and beneficial in the long run to both. One of the recommendations was that on all orders for less than 350 pounds, an additional charge be made, as the basis of a sliding scale decreasing on orders between 350 and 500 pounds and again between 500 and 1,000 pounds.

To carry out the program further a committee was appointed consisting of George W. Ward, of the D. L. Ward Company, F. A. O'Neill of the Paper Manufacturers' Company, H. N. Heral of the Quaker City Paper Company, Joseph Weaver of the Garrett-Buchanan Company and C. A. Wilder of Wilder Brothers. The committee met subsequent to the general meeting and arranged for another session of all the trade to be held about April 18 at which it is expected definite steps toward organization will be taken.

CANADIAN NEWS PRINT TO U. S. INCREASES

News print, wood pulp and lumber are the chief products that contributed to the increase in Canada's exports to the United States for the eleven months of the present fiscal year, as compared with the corresponding period for the last fiscal year. The group of wood, wood products, and paper, to which these articles belong, account for more than half of the total increase of $63,000,000 in our total exports to the United States. Canada's total exports to the United States for the eleven months just past were $330,000,000 as compared wih $267,000,000 approximately, for the corresponding period of the year previous, while the exports of the wood products group went up from $133,000,000 to $169,000,000.

BUY WHITAKER WAREHOUSE

The Whitaker Paper Company sold its Philadelphia warehouse stock, furniture and fixtures on April 5 to the Garrett-Buchanan Company, which will take over the lease and use the building at 26 North Fifth street as an emergency warehouse for its American Writing Paper Company lines. This deal, which was consummated on Saturday, April 7, will enable the Garrett-Buchanan Company to give an uninterrupted service on Eagle "A" Papers.

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PAPER MERCHANTS IN CONVENTION

Twentieth Annual Meeting of the National Paper Trade Association of the United States Held at Waldorf-Astoria, New York

F. W. Power of Carter Rice & Co., Boston, Mass., Is Elected President of the Association for the Ensuing Year—Fritz Lindenmeyr Is Chosen Vice President in Charge of Fine Paper Division and J. A. Carpenter, Vice President, in Charge of Wrapping Paper Division—Secretary Ridgway Reports Association Gaining in Membership and in Sound Financial Condition—Fine Speeches at Meetings.

The Wrapping Paper Division of the National Paper Trade Association met in the Astor Gallery of the Waldorf-Astoria at 10 o'clock Wednesday morning, April 10, it being the twentieth annual meeting of the association. Frank W. Power, vice-president, in charge of the Wrapping Paper Division, presided.

Chairman's Remarks

MR. POWER: Gentlemen, it is certainly gratifying to us to feel we have passed the era of depression and that we come here today, feeling that conditions have become so stabilized that we may be optimistic as to enjoying a healthy condition for 1923.

The first business is a report of the Statistician, Leslie M. Pape.

Statistical Report

MR. PAPE: The most important happening in the statistical department during the past year, from my standpoint, at least, was the resignation, after nearly four years of service, of your former statistician, Mr. Farrar, and the selection of myself as his successor. It would be strange indeed in such an occurence, if the new man did not have some criticism to make of existing methods and did not have some ideas of his own as to certain improvements that might be made or at least tested out.

The particular case in question is no exception to the rule. It is, however, I am glad to say, more a case of making certain additions to the existing structure rather than tearing down what has already been built up and rebuilding. To carry the analogy further a few touches will be added here and there to make the building more attractive or more useful.

There is one circumstance that affords considerable satisfaction and that is the fact that we have continuous records of a comparatively large number of members from the time the statistics were first compiled until to date. Since the aggregate number is large enough to be fully representative of the whole trade, this means that we have a complete history of the trends and fluctuations in the paper trade for four years. We have for example, to take something very recent, an actual record of the exact extent to which members were actuated to make purchases during January, 1923, in anticipation of price increases.

F. W. POWER, PRESIDENT

The number of members whom I have referred to as reporting regularly and who are now reporting is forty-five. In addition to these are fifteen Class A and four Class B members, who started reporting later. This makes a total of 64 members and, if to these are added two members who temporarily discontinued reporting and two who recently signified their intention to report, there should be at least 68 reporting members during the coming year.

A Few Comparisons

In view of the short time during which I have been connected with the association, you are doubtless all more familiar than I am with the wrapping paper statistics and I am not going into them in any detail. Just a few comparisons, however, which I have made of purchases and shipments during the three years of 1920, 1921 and 1922, and the first eight months of 1919, may interest you. Expressed in terms of percentage of normal, they are as follows:

	Eight Months of			
	1919	1920	1921	1922
Wrapping Paper				
Purchases..	114	86	63	82
Shipments..	91	100	64	79
Tissue:				
Purchases..	118	61	37	50
Shipments..	92	79	41	58
Toilet and Towel:				
Purchases..	98	68	78	79
Shipments..	94	88	76	79
Bags:				
Purchases..	118	74	71	80
Shipments..	94	92	76	79

There is one interesting thing about that. I think if you take the eight months of 1919 and 1920 and add purchases in those two years, and then add the corresponding figures for shipments, I think you will find they are just about equal in each case. In other words, having an excess

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purchase in the one year inevitably results in a decreased purchase in a successive period of time, or at least no corresponding decreases in shipments. I do not intend to go ahead along this line. I do want to promise that there will be some interesting statistical information which will emanate from my department during this year. All I ask of you is that if you get a memorandum from me, that before passing it into the universal file, that you will look it over and see if it does not contain a few facts worth knowing.

The general paper on the subject of statistics will be read at the General Meeting on Wednesday. I thank you. (Applause.)

MR. POWER: Gentlemen, you have heard the report of Mr. Pape. What disposition do you wish to make of it?

(A motion made and seconded that the report be received was unanimously carried.)

Report of Assistant Secretary

MR. POWER: The next on the program is a report of the Assistant Secretary, Mr. C. K. Higgins.

MR. HIGGINS: The first thing that I want to touch upon is the increase in the activities during the past year of the local associations. In the past year local associations have been organized—and associations which I may say are worthy of the name—in the following cities: Boston, St. Louis, Dayton, Cleveland, Louisville and Kansas City. Now, there are other cities that I have not mentioned, because they have always had their local associations, but these associations that have developed in the last year have organized for the reason that they have felt the necessity of local merchants standing together for a common end. I think that every year in the paper business shows us more and more that if we are to be successful, it must be through co-operation, one with the other, and in these six cities, in spite of many handicaps which they have made, they have decided that it was necessary for them to form local associations.

As you know, for the past two or three years, the Southeastern Association, which was composed of paper merchants in the southern territory, has not functioned. In February of this year, Mr. Schoenbucher and I went down to Birmingham, Alabama. We had invited seventeen of the leading paper houses in the southeastern territory to be present at this meeting, and everyone accepted our invitation. A new association, which will be called, I think, the Southern Paper Trade Association, was formed.

The names of the members of this new association are as follows:

S. P. Richards Company, The, Atlanta, Ga.; Archer Paper Company, Chattanooga, Tenn.; Jacksonville Paper Company, Jacksonville, Fla.; Tayloe Paper Company, Memphis, Tenn.; Jackson Paper Company, Jackson, Miss.; Clements Paper Company, Nashville, Tenn.; Sloan Paper Company, Atlanta, Ga.; Southern Paper Company, Ltd., New Orleans, La.; Tennessee Paper and Bag Company, Memphis, Tenn.; Florida Paper Company, Jacksonville, Fla.; Roesch Paper Company, Tampa, Fla.; National Paper Company, Atlanta, Ga.; City Paper Company, Birmingham, Ala.; E. C. Palmer & Co., Ltd., New Orleans, La.; Western Newspaper Union, Little Rock, Ark.; Birmingham Paper Company, Birmingham, Ala.; Atlanta Paper Company, Atlanta, Ga.

WM. C. RIDGWAY, SECRETARY

South Organizing

We feel that this is a great step forward, as assisting the National Paper Trade Association in its varied activities. The south has not been organized, and now the south is organized. These same members had a meeting just two or three days prior to this meeting, and they adopted a set of by-laws, and at a meeting of the Board of Directors yesterday made formal application for membership in the National Paper Trade Association. That application, of course, was favorably received, and in place of a dead organization which did not function, we have now, we think, a live, organization. We feel very much encouraged over the enthusiasm which we have been able to develop in the south.

Matter of Collection

The next thing that I want to bring to your attention is the matter of collections. As you know, our office in Chicago runs a collection service for the National Paper Trade Association. I would like to read the amounts which we have collected in cash for the various associations:

The Empire State	$141.44
The Middle States Wrapping Association	16,607.97
Missouri Valley	1,168.97
The New England Association	8,281.99
The Northwestern Association	1,820.06
The Philadelphia Association	161.21
The Southern Association	1,717.24
The Western Association	72.85
The Wisconsin Association	214.17
Making a total collected between March, 1922, and February, 1923, of	$30,185.44

Now, as I have stated before, all of those accounts were accounts which your individual organizations had given up as being more or less uncollectible.

Amount of Money Collected

I would just like to compare the amounts of money which we collected last year and this year:

Last year, for Philadelphia we collected $40.26; this year, $161.21.

For Wisconsin, the year previous, we collected $19.90; this year, $214.17.

For the Northwestern Association we did not collect anything in the previous year. We collected $1,820.06 this year. In New England, the year previous, we collected $467.44; this year we collected $8,281.99. For the Southern Association, in the pre-

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vious year, we collected $34.11; this year we collected $1,717.74.

I would like to call your attention to the fact that the service is absolutely free. All you have to do is to send us your account in duplicate. We keep one of your statements of your accounts in our files, send one to your debtor and, in a majority of the claims we get a remittance. I would ask that any of you gentlemen who feel so inclined would take this up with your credit men, and if you are not using this service I think you are neglecting one of the things which makes it worth your while to be members of the National Paper Trade Association.

You have all seen the reports of the Income Tax office. You certainly know that those reports show that people are making money, and if people are making money, ninety per cent of them will spend money in almost exact proportion to the manner in which they make it. This concludes my report.

I think we all realize that the wrapping paper business is what we might call a secondary business. In other words, its prosperity comes after the general prosperity of business. People, when they earn money, spend that money and buy goods. It is a very logical sequence that when general business in good, the wrapping paper industry soon follows.

MR. POWERS: Gentlemen, the next number on the program is Mr. Harvey E. Platt, ex-president of this association, who has made a great study of the budget system. I will now call on Mr. Platt. (Applause.)

What a Budget System Did

I might say, in his making his introductory remarks, that his subject is "What a Budget System did for the J. L. N. Smyth Company."

MR. PLATT: Mr. President and Gentlemen: In attempting to discuss the development of accounting analysis and budget, we do not want to be misunderstood. Let me state frankly we do not claim to have found a cure-all for the many problems that confront the business house from day to day; neither do we believe that we have reached the end of the road in the development of our accounting system. On the contrary, the development of evolution—to use a much abused word—of the accounting system for any individual business is a continuous and never-ending process. Again, while the fundamental principles and generalities may be the same in any group or even in all business houses, the individual system is individual in character and should be developed by careful study and analysis of its own business by each individual firm.

We do not believe that a system in one house can be taken bodily and successfully transplanted to another house. This being true we have no desire to argue as to whether or not the system we are developing will fit another's business; neither would we presume to pose as teachers of accounting. In installing our budget system we have simply taken another step in the development of our own system, a step which has proven of much value to us in guiding the policy of our business and which we believe will be even more valuable as time goes on.

When we accepted Mr. Higgins' invitation to discuss our budget system at this meeting, our sole purpose was and is to share the idea with other association members. If there are any ideas in it which others can use, well and good; if not, we have wasted your time.

Past History Must Be Considered

In order to install any kind of a satisfactory budget, the past history of the business must be considered and the data must be made up from figures and records already in existence. The length of time that this requires is dependent entirely upon the completeness of your records, or upon the possibility of their being analyzed and the expenses properly classified. In our own business we started with a very simple system of accounting, a system in fact so simple that it received criticism from outside accountants employed from time to time by our company. For a number of years our records were based upon a daily exhibit, which did not permit of such subdivision of expense, but beginning with January 1, 1920, a system of distribution was put into effect which is virtually identical with that of the National Paper Trade Association introduced a year later. So closely did this system follow the system recommended by the National Paper Trade that nothing but the minor changes were necessary, such as separating administrative and office expenses into two groups. The Smyth Company does not follow with exactness the method of prorating its expenses over Direct, Indirect and Warehouse business, as suggested by The National Paper Trade. Its methods, however, have withstood the most determined criticism for the past three years. Bear in mind, however, that the principles of our cost distribution are exactly the same as those recommended. The only purpose in mentioning this is to show you the availability of the data on which to build our estimate of expenses. During the past year The Smyth Company reduced its expenses to what it considered to be a minimum, but when its expenses for the past three years were considered in detail by the executives of the company in a series of conferences, the amounts appropriated for the current year will cause considerable further reduction in our total expense, if these estimated are lived up to. Let me emphasize here that no plan of keeping the expense at a minimum, whether called a budget or not, will avail you anything unless a very conscientious effort is made to keep those expenses within the amount appropriated, and this requires constant watchfulness on the part of the executives responsible.

Must Cover Every Phase

I find that some houses in talking about a budget have in mind simply a budget of expense. Real budgetary control covers every phase of the business, income as well as expense. A great many business men believe that real budgetary control is possible only in large industries, or in some other business, "because his particular business is different." Our experience is that when we got down to brass tacks we determined we could plan with some reasonable degree of accuracy, not only our expenses, but our income, and in so doing we passed our business under the microscope and to my mind this is one of the most beneficial results of our work since our limited experience under budgetary control.

Now that our business is being managed under budgetary control an exceptionally good month in the way of sales or lessened expense does not deceive us as to the actual outcome of the year's business, because under present circumstances we know largely in advance just what our business is going to net us. We lay all our plans accordingly and are preparing to use the information so gained in handling with some effectiveness our financial arrangements. In other words, the budget system gives us a much longer vision of our business than the day to day vision, or even the month to month vision that we get in the ordinary way. By the budget we can get a six months' or yearly vision of our business and know what is ahead of us, barring accidents and unforeseen circumstances.

There is one point that I would like to make, and that is that part of the basis of this budget was laid when our house started to report statistics to The Technical Association, because in estimating our total income for the next year the fluctuations in the cost and selling prices of paper do not concern us greatly, for the reason that our estimated profit per pound and the number of pounds to be sold, furnish the information desired. That our gross income is based not upon dollars and cents value of the amount of our sales, but on the tonnage sales multiplied by the expected profit per pound, and that in turn is based on our past experience. One of the direct results of our study in this connection has been the effect upon our determination to maintain a proper relation between the selling price and the cost of the goods.

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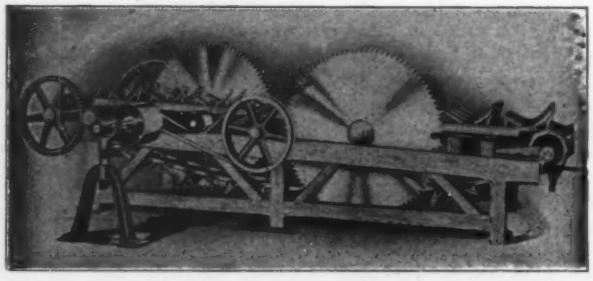

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work we have been doing in the Association in the way of cost accounting, statistics, salesmen's compensation, proration of expenses, etc. As white light is the synthesis of all the colors of the prism, so may it be said of the budget that it gathers together our statistical and cost accounting records and all of our records and analyses and puts them into such shape that we can get the utmost results from them. All of these records, in which as an association we have been endeavoring to interest our members, form a graphic history of each individual business. The budget takes these figures, makes a forecast from them not only of expense but of income and sales volume in pounds and enables us to put the emphasis in three directions:

1. To keep expenses down.
2. To increase gross profits.
3. To increase sales volume.

The enthusiasm is imparted to our entire organization to get that extra punch—which means profit at the end of the year. It is to our business what a pacemaker is to the man running a race.

Having worked for a number of years not only with the Smythe Company, but with other paper houses, Mr. Kimmey is not only familiar with the paper business, but he brought to it a fund of knowledge gained from intimate contact with successful concerns in other lines of merchandising. At our suggestion he very kindly offered to present to us this subject in more concrete form. After concluding his paper I know he will be only too glad to answer any questions you may have to ask, or to consult with anyone after the meeting is over.

I might state here when Mr. Kimmey first suggested that we discuss this budget system was when Mr. Higgins first discussed this budget system, and I felt that Mr. Kimmey, being thoroughly familiar with the details of it, much more than I am, would be able to give you a much better history and a much better discussion of the details of it than I possibly could, and he very kindly consented to come here and give us the benefit of his experience in this work.

Cost of Installation

I just want to say one word about the cost of installing this system. The cost of running it, frankly, I do not know what it costs, because we have not added anything to our payroll to the cost of installing it, but it figures out approximately, based on 22 sales, one-half of one-tenth of one per cent. (Applause.)

MR. POWER: You have heard the very interesting paper read by Mr. Platt. I feel that Mr. Kimmey needs no introduction. Mr. Kimmey will address you on the budget. (Applause.)

Mr. Kimmey on the Budget

MR. KIMMEY: Mr. Chairman and gentlemen: Mr. Platt asked me to come here and talk to you, at Mr. Higgins" suggestion, and I very gladly availed myself of it, because Mr. Platt has been a very good friend of mine; but he gave me just a little slam today, so I have to get back at him. I have been working with Mr. Platt for about three years, and I have been trying to drill into him the fundamentals in cost accounting, and the principles of accounting generally, and I see he has failed completely to grasp one particular point. You cannot expect the auditor who puts down an expense figure to put down also the amount of money he expects to collect as fees for that particular budget, because he does not think that is an expense. That is an investment, and there is all the difference in the world between an expense and an investment. Mr. Platt is going to learn.

I have been interested in the problems of the wholesale paper trade ever since about three or four years ago. I began in Philadelphia to chart the sales and the costs and the expenses of doing business and the stock on hand. Now, the enthusiastic co-operation of these Philadelphia friends, their counsel and advice, and their earnest efforts to bring about better conditions in their business, have kept highly stimulated my interest in the problems of the paper trade. These intensely interesting and difficult problems are going to occupy the very best minds in the industry. It is my opinion that you are in the very midst of a major evolution, and that the next few years will bring about many new and strange conditions in your methods of business.

I do not know whether I am a good prophet or not, but I think that numbers of you are aware of this condition, as is evidenced by the studies you are now making of the rising costs of doing business in your trade and the various suggestions that are being brought forward to relieve a situation by no means unique, but decidedly one for concern.

In line with this movement, the farsightedness of my good friend, Mr. Platt, and his co-executives of the J. L. N. Smythe Company, led to their negotiating with my office late in the year 1919, for the preparation and installation of a system of accounts and records for the proper classification of sales, costs, and expenses of doing business, and the prorating of these expenses over the three classes of their trade, direct, indirect and warehouse.

This new method was duly applied to the accounts at the beginning of 1920 and has been in continuous operation, with a few modifications and elaborations, ever since. You will find that I repeat here and there a little bit of what Mr. Platt has said, because I believe these points should be brought out.

It has been subjected to searching examination and questioning, but has been proved to be fundamentally correct.

Not an Easy Task

The Smythe Company has not had easy tasks from time to time in this accounting system. They wanted to be shown, and we had to get down to brass tacks. When they said, "This cannot be right; there must be something wrong," then they had to be shown that that was absolutely and exactly right. So they questioned him from time to time, and they questioned it and examined it very searchingly, and it so happened that the system adopted was remarkably similar to the one recommended only one year later by the National Paper Trade Association.

For three years, therefore, a rather complete classification of expenditures and an analysis of sales and costs have proven their great worth to the officials of the Smythe Company. These records have laid a very satisfactory basis for actual budgetary control.

You will appreciate the fact that in this discussion, we may but touch upon some of the advantages and the methods of applying the principles of budgetary control.

These advantages have been demonstrated throughout the history of civilization by the improvement which each generation has made over the previous generation in anticipating the future with a view to avoiding or mitigating business catastrophies, providing for periods of want and depression, and taking all possible advantage of approaching changes.

The principles of business forecasting have been applied in many ways by the greatest of the world's generals and leaders.

It is said that Napoleon's campaigns were fought out, months in advance, over maps in which he stuck pins which bore heads of colored sealing wax to represent contending armies. The great general staffs of modern armies are but highly organized machines engaged in the business of scientific destruction.

Classified Into Groups

Business leaders such as Lord Northcliffe, who said that his most valuable maxim was "To foresee is to rule," have come to realize that they can perform properly the tasks of today only if they have already planned those tasks yesterday and planned also the tasks of tommorw. There are many who do not plan scientifically, but there are few who will deny the merits of the system. The planning which may be done in connection with any particular business may be classified into broad overlapping groups.

1. That which deals with the operations of the separate de-

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partments, such as production, sales and finance. This planning has been described loosely in the past as "industrial engineering."

2. That which deals with the co-ordination of the operation of the several departments to the end that a well formulated program may be made for the business as a whole. This planning may well be termed "budgetary control."

3. That which deals with the determination of future conditions as reflected in the business cycle and the shaping of the plans of the business to meet these conditions. Such planning is known as "forecasting" or "business predicting."

Our present discussion confines itself to the second kind, yet budgetary plans are vitally affected by business cycles and departmental plans are equally affected by the budgetary plans.

The companies which I have been privileged to serve as Budget Engineer, if one may use such a term, have been such companies as yours, that is, merchandising or selling organizations, primarily, and not manufacturers of the merchandise sold.

Each claimed to have a different kind of business; the personnel and organization of each presented divergent ideas; various degrees of accounting proficiency were exhibited, and each gave a different reason for wanting our services. But there was one single objective—to make greater NET profits. As far back as 1910, we were not very familiar with the term "budgetary control," yet to an extent we practiced it no less certainly then than now.

Budgetary Control Eagerly Secured

Overnight, one cannot secure budgetary control. It must be prepared for, prepared for very deliberately in the minds of the executives of the business which is about to install it, or rather, to take the initial steps toward it. These executives have come to realize that their policies can best be formed and carried out by the formulation of plans submitted for approval in black and white. In no other way can co-ordination in a business be accomplished for any great length of time.

Anyone who seriously considers the methods and purposes of forecasting realizes that foresight is 90 per cent hindsight. No magic combination of figures, formulæ, or tables will forecast a man's business for him.

Success depends in the first place upon the existence of reasonably complete and reliable data. Usually this data exists, although it may have to be brought to light, reclassified or regrouped to make it available and worth while.

I cannot resist the temptation to digress for a moment to remark upon the surprisingly large number of otherwise progressive executives who, for fear of red tape, hold on to the old and very expensive methods of bookkeeping. Newer methods are so much easier, so much simpler and so much more informing, and usually they actually cost no more and often less to operate.

Our experience is that executives study past records in an endeavor to correct or to remove the difficulties of last year and to do this year what should have been done last year. And because of the lag of the usual accounting records, it is a very difficult matter for executives to really know the present day conditions of their business. Study history for the purpose of finding a basis for a positive program for the future.

Value of a Positive Program

The value of such a positive program for the future lies in the fact that it necessitates a definite plan of action and the establishment of a definite series of goals to be reached within a definite period of time.

Let us go back to our boyhood days and let us all go high jumping. At a suitable place we set up two upright poles some distance apart. Now, it wouldn't be any fun just to jump an unknown height between two sticks, so we place a cross bar between them so arranged as to enable us to lower or raise it at will. To clear the bar as we inch it up, we put forth a gradually increasing effort, until we finally reach the very limit of our powers. That bar has registered our efforts and urged us on until we have done far better than we otherwise would, and we have kept at the game much longer than we would have done if that bar had not been there.

Now, a sales quota is just such a spur to our efforts in the game of business. We must be careful to place it at the proper height for our first effort—too low or too high will prove almost fatal to our real effort. And because we really don't know just what we can do in this game nor where to place that bar at first, we analyze and study our past records. That's our standard to push us on and to restrain us if we feel too full of pep. We must not overstrain our resources. This is a very real danger. A sales quota is not to be based upon guesswork. We must analyze in as much detail as possible the amount, the quantities or volumes, and the character of the previous sales.

With these facts in hand we consider the present and probable status of our stocks, our finances, and other internal conditions of our business. We consider also the general business and industrial conditions, especially those factors which are most likely to influence our own affairs.

A point to which we must give some real thought is the length of the budget period; that is, the time for which we are going to make our forecast. This varies in different businesses and is influenced in your own business by the availability of your sales information. The time measure of the budget period is the turnover period of the business.

We are much more concerned with the volume in tons or pounds than with the amount in dollars of the sales, because we want to arrive at the amount of the merchandise which we must have on hand, or to purchase, in order to carry out our sales program. Likewise from the volume of sales and the estimated gross profit per unit, we calculate our total of expected gross profits. It is out of these expected gross profits that we must pay all of our expenses, if we are not to encroach upon our capital.

Gross Profits

Gross profits! Who will deny their importance and the attention they are receiving? Plan after plan for increasing them is being offered and tried out. Plan after plan has failed because it was not economically sound. Possibly because of my long and rather intensive chain store training, I view this matter somewhat from that angle.

A difference of a quarter of a cent a pound, for instance, may not amount to very much, but in the aggregate of a year's sales it amounts to an amazing total. Try to figure out the percentage of this amount to your selling price. Illustrate this to your salesmen, and you will have them thinking from an entirely new angle. We have done that and it has been surprising. At times it is well to think in terms of tenths of a cent. Chain stores operate and think of things in many hundreds of thousands, where the average man thinks of them in thousands, and a tenth of a mill is a very big item to be considered.

I haven't any doubt that in making up your first sales estimate you may experience some difficulty in convincing yourself that this is a practical thing. There are so many uncertain factors to consider. The thing can be done if you have first analyzed the information at hand, however exhaustive or meager that information may prove to be. You will accomplish the best results if your information on the volume and amount of the past sales is in some detail. Estimate your future sales with the aid of your salesmen and by territories and commodities or classes of paper. Then the total will take care of itself. In some cases it is important to know when sales are made, that is, during what periods or seasons of the year.

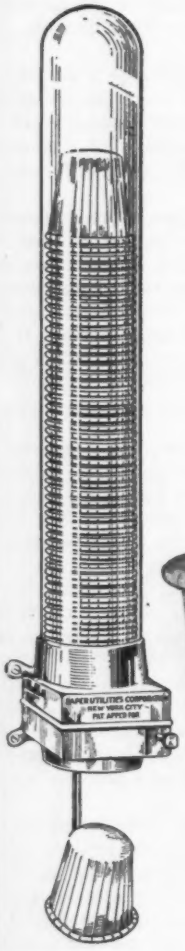
How Much Stock Must Be Carried

Having tentatively determined upon what and how much you expect to sell, our next thought is for the necessary purchases of

There's More Money for You in

TULIP

CUPS



because
—they're better made
—they cost less
an ideal combination to make selling easier.
—Drinking cups
—Soda cups
—Souffle cups
—Wax cake cups
—liners and butter chips
—Dispensers
Sanitary, one piece—rolled rim—clean tasting.

Write for samples and prices to Dept. PJ.

Paper Utilities Co., Inc.
220 Fifth Ave., N. Y.

CONVICTIONS *from the* CONVENTION

We were convinced, from personal contact and observation at the Convention—

That the B & P organization is most generally regarded, in all circles, as a paper merchandiser of integrity, resource and ability—

That the paper and paper products merchandised by the B & P organization are known to be uniformly accurate, approriate and advantageously priced—

That the close cooperation of the B & P organization with its customers and correspondents, is deemed decidedly thorough, helpful and gratifying.

As these good words expressing good-will came from varied and various sources, our convention convictions seem to be well founded.

To those who may be seeking this sort of a paper service, we desire to demonstrate that we *do* live up to our convictions—conscientiously, carefully, continuously.

Our nearest office will please you promptly.

Bermingham & Prosser Company
Kalamazoo, Michigan

105 West 40th Street
New York City

10 South LaSalle Street
Chicago

BERMINGHAM & PROSSER CO. KALAMAZOO CHICAGO NEW YORK PAPER

materials, and how much stock must be carried. Our sources of supply and the conditions of the market and all the other conditions that influence our purchases must be given due weight. These conditions may conceivably greatly affect our sales estimates. Usually our sales estimates are made with these conditions in mind. And here it is well to bear in mind that neither sales nor purchases are of themselves the dominant factor in a business; they are very necessary parts, to be sure, but the dominating thought must be Net Profits.

We do not like to think of a business being run on so close a margin that it does not pay interest on the money invested. Statistics show, however, that this is so prevalent a condition that it is the status of more than half of all business houses. And these are the houses that set the pace in the matter of prices, costs and expenses. It takes, it seems, real ability and a great deal of careful watching of expense to push a business from the break-even column into the make-money class.

Your assistant secretary is telling you about the statistics of different houses, and a great many of them made three per cent. If you went to your banker and asked him what he thought the business in a flourishing condition ought to make, he would very promptly tell you double interest. That has been the old law since Adam Smith, and it is still the present law. A banker may not have heard about Adam Smith at all, but he will say "Double interest." Frankly, gentlemen, I do not know of any group of merchants, not in my experience at least, who work so hard, make such big sales and make so little real money.

The sales and purchases of a business are presumably made in a competitive market where it has the same advantages as its competitors. In so far as this is true the percentage of the gross profits of competing businesses tend to be the same. But because of the wide variations of expense the operating ratios and the net profits vary so greatly.

To secure a control of expenses which is at once effective and not unduly burdensome, is one of the most important and difficult tasks of business management. Unless that control is secure, the expenses have a very decided tendency to increase, and as they increase, the profits tend to decrease.

Many of the expenses incurred in the functional operations of a business are small in amount, yet the sum total of all expenses in most business is sufficiently large to absorb a very great part of the gross profits. This proportion of expense to gross profits is known as the operating ratio. The operating ratio determines whether the business operates at a loss or a profit.

One of the very decided advantages of budgetary control is that it brings this operating ratio directly to our attention. It brings us face to face with facts, however disagreeable they may be. It does not seem that many accounting systems are designed to avoid our meeting operation ratio.

In a busy establishment, executive attention cannot be given to each separate item of expense, but it can be focussed very effectively upon groups of related items.

A proper classification of expenses is the very first step in effecting a proper control of them. The National Paper Trade Association made a long step forward when it recommended a standard classification. I do not doubt that you have availed yourselves of these recommendations, nor that you are now ready for further progress in the same direction.

For budgetary purposes, it is often necessary to group the items in quite a different way from the usual accounting classification. If, however, your expenses are classified according to the standard classification or in a manner comparable to it, but little additional analysis may have to be done. The information required is that which will permit a determination of the cause of the expenditure, its relation to other functional requirements of your business, and of the necessity and extent or amount of similar expenditures for the period of the budget. There are expenditures other than those for functional requirements, such as administrative or management and corporate expenditures. Care must be taken to include these as well as expenditures that are of a less direct class such as depreciation, and losses from bad debts. All expenses and expenditures must be provided for if one is to have real budgetary control.

Quite a number of executives make some sort of a budget of expenses and are content to stop there. The moral effect of making a budget of expenses soon wears away and the executive is annoyed to see the expenses mounting higher and higher and no thought, apparently, being paid to the limitations imposed by his budget.

Remedy for This Condition

A remedy for this condition is found in the constant checking of actual expenditures against the budget estimate. A good accounting system is one requisite. One house experienced in budget control has appointed a very reliable clerk as Budget Meter. As expenses are incurred the bills are recorded daily by the Meter who notes their totals and sounds timely warning. Despite a growing business this plan has operated to reduce constantly the cost of operating in this particular business.

This happens to be a Brooklyn department store. They have been constantly reducing the expense two and three per cent every year, by the use of this budget meter. They do not wait until the budget has been exhausted. They know when it is approaching the danger mark.

The estimates of expenses should be made by departments and in such detail as is practical. In these estimates, no department should be charged with an expense over which it has no control. Such expenses should be considered as a separate group. In other words, there should be no prorating of expenses. Each item or group of items should be separately considered and future expenditures determined upon after taking into consideration present and probable conditions and necessities. A real discussion of these items with one not influenced by either the customs or prejudices of the trade, is very helpful and productive of much saving. Mr. "It-can't-be-done" ought not to be admitted to the conferences.

And "Find the way to do it" is generally the accepted slogan together with "It must be done" when all these estimates of sales, costs, gross profits, expenses and net profits are brought together and summarized. If you have never done this before you have a new thrill and an experience coming to you.

Suppose your summary showed something like this:

Gross sales	$500,000
Gross profits	100,000
Expenses	120,000
Deficit—operating interest or dividends unearned	10,000
Total deficit	30,000

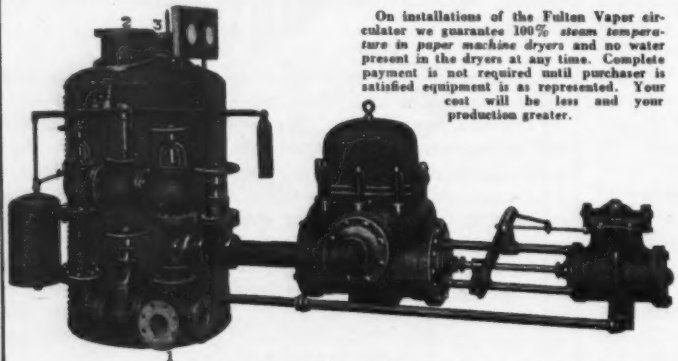
I think your first thought would be, "We have got to increase our sales." That is always the first answer. Now, suppose you refer to your sales budget. Have you any hope there? Possibly a little, but there is not much, certainly, if you have carefully estimated the profits and the possibilities, and you have got to look further. What about gross profits? Something possibly here if you go at it in the right way and secure the enthusiastic co-operation of your organization. It can be done without advancing prices in any way. Remember what I said about the tenth of a cent, instead of a quarter of a cent? It is a big difference. Sometimes you look into your buying a little more carefully. Stretching that line between the cost of your goods and the selling price is something that can be done in a way that will surprise you, once you go at it and realize the significance of little things. Now, what about the idea of making the system pay? We hear a lot of differentials of forty per cent. Our business is retail, and all that sort of thing. I believe certainly in taking advantage of anything that is fundamentally and economically sound.

The competition that always occurs is bound to destroy all of such hopes.

The FULTON Forced Vapor Circulator

KEEPS ALL WATER OUT OF DRYERS

Reduces Fuel Consumption—Increases Production



On installations of the Fulton Vapor circulator we guarantee 100% *steam temperature in paper machine dryers* and no water present in the dryers at any time. Complete payment is not required until purchaser is satisfied equipment is as represented. Your cost will be less and your production greater.

Not necessary to stop production while installing the Fulton Circulator since there are only three connections necessary, 1, 2 and 3.

The production of your paper machine is limited directly proportional to its drying capacity; its maximum production can be reached only when equipped with the foremost system of removing the air and water of condensate from the dryers.

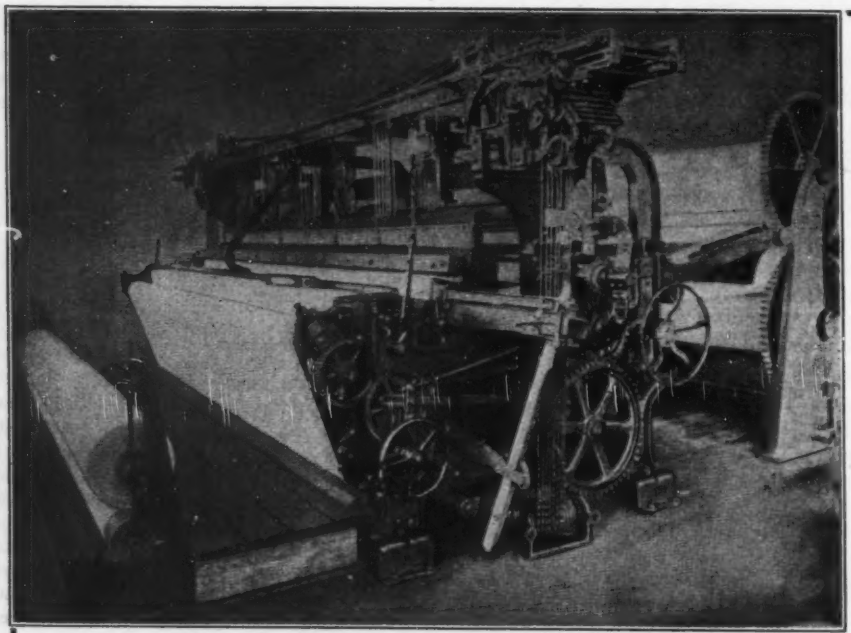
The condensate drainage problem is very much simplified in paper mills equipped with the Fulton Forced Vapor Circulating System. Through its operation the water of condensate from the entire plant can be returned to the boiler room; no complications, no additional expense for traps, pumps or like equipment.

U. S. Patents, Dec. 10, 1918, June 7, 1921. Canadian Patents, July 6, 1920. Patents pending.

Why not ask us what we can do for your machine—it costs nothing

The FULTON ENGINEERING COMPANY

MIDDLETOWN, OHIO



FITCHBURG DUCK MILLS

ESTABLISHED 1844

FITCHBURG, MASS.

MANUFACTURERS OF

Multiple Ply DRYER FELTS

English Weave in Two, Three, Four, Five and Six Ply—60 Inches to 176 Inches in Width.

Fine Faced Felts for Fine Papers. Absolutely no felt marks in paper.
Tribune Three Ply Felts for Coarse Papers.

Proper Expense Justified

Real service—necessary service, not merely customary and intensely competitive service—will justify its proper expense. Again examine your costs in this new light. Be ruthless, if need be, but cut them. It has been done and can be done, and if you don't do it this year, you will the next, wishing all the while you had done it before.

I haven't the slightest desire or intention of being considered a pessimist, but the things I have suggested have happened, actually, and I know that many of you will make more money and sleep easier if you apply budgetary control to your affairs.

Having revised and adopted your budget estimates, it is necessary to keep in mind that these will not execute themselves. Every possible effort should be made to equal or excel them. Detailed plans must be made for their attainment and these plans must be enforced rigidly. Responsibility for the forming and carrying out of these plans must be definitely placed.

When it is deemed desirable or necessary to exceed the department expense as allowed by the budget, the increase and the reasons therefor should be submitted in writing. If the increased expense is allowed, the original budget should be corrected accordingly.

In this paper I have attempted but to outline the very beginnings of budgetary control and the steps necessary to make it effective. Once operating to this extent, I have no doubt about your wanting other estimates and controls.

Budgetary control is clearly a matter of evolution and proficiency in planning and forecasting is a matter of experience. Budgetary control is not designed to deprive executives of that freedom of action so essential to progressive business management. It is not a substitute for administrative ability in management. It is not a law, but a business guide.

If you have any questions, gentlemen, I will be very glad to answer them. (Applause.)

(Motion for a standing vote of thanks was made and duly seconded, and unanimously carried.)

MR. POWER: I want to thank you for this very interesting paper that you have read. I trust all of you gentlemen will go home and think it over, give it careful consideration, as to the application of the budget in your business.

The next thing on the program is the cost accounting bureau, by N. A. Schoenbucher.

Cost Accounting Bureau

MR. SCHOENBUCHER: Mr. Chairman and gentlemen: This is really none of my business, but I was just wondering whether any of you gentlemen got the impression that because Mr. Kimmey followed Mr. Platt, that he found all of these inefficiencies in Mr. Platt's business. I happen to know, and I think that the other Philadelphia distributors will bear me out in this—I do not know of anybody that knows how to run a wrapping paper business better than the J. L. N. Smythe Company does.

In last year's report it was pointed out that there was an absence of uniform practice in the merchandising of wrapping paper. Only a few merchants had introduced the practice of establishing their own selling prices based upon mathematical formulæ of mark-up in various quantities. By far the majority gave cost prices to the salesmen, who, in turn, were permitted to determine their own selling prices, depending upon the exigencies arising with each order or potential sale. It has been felt by many of the latter merchants that where the compensation of salesmen was based on a percentage of the gross profit, ample incentive was thereby furnished to encourage salesmen to sell at the best possible prices.

Low Average Earnings

My observation in most of the markets of the country during the past year leads me to believe that wrapping paper merchants, taken collectively, have not averaged earnings of two per cent on the sales out of stock from merchandising since about 1916.

By that I mean if we eliminate the market exchanges, both the profit and loss, to the changing prices since 1916, that all of the figures I have seen in various parts of the country, there has not been made in these war profit years—there has not been made two per cent of such profits on the sales from actual merchandising, and that includes 1922; and by the way, this is not a quarrel with Mr. Higgins' figures, but I am commencing to realize that I have not been very successful in pointing out the cost of doing business in the paper business, for I am absolutely convinced that if the aggregate results of all paper merchants throughout the whole country, or in any section of the country are taken for the last year, 1922, the average profit would not be one and one-half per cent net on the sales. This is no quarrel with Mr. Higgins' figures. He is not responsible for those figures, but that is close to the truth, and the only reason I bring that out is because you men may go back to your own respective establishments and criticize your own internal affairs, or attempt to adopt measures which may be entirely innocent, in order to correct conditions which you may think exist in your business.

Definite Educational Program

With the foregoing conditions in mind, this office started a definite educational program in the Wrapping Paper Division in about August of 1922. Demonstrations by means of published pamphlets, local talks and personal visits have convinced large numbers of merchants of the following:

First, that it is both practical and desirable, and also in fact necessary for wrapping paper merchants to arrive at selling prices for various quantities of sales out of stock based upon the mathematical facts derived from their own records, in order that reasonable, definite, stable net profits be earned from year to year.

Second, that these prices should be clearly set forth in salesmen's price books and that salesmen must be taught that these established prices are inviolate from the abuses of customer favoritism and real or imaginary competitive agencies.

Third. That the practice of paying salesmen a certain percentage of the gross profits with no provision for expenses is bad. In fact, the results arising from this practice are often destructive to such efforts as are made to improve merchandising conditions in the wrapping paper industry.

To the few merchants who for years have subscribed to these three points even to the extent of conducting their own establishments in conformance therewith, many more have been added during the past six months.

In practically all markets many, if not most, wrapping paper merchants have now adopted the practice of giving salesmen selling prices based on the needs of their individual businesses. Quite a number of merchants have discontinued the practice of paying salesmen a percentage of the gross profit and now add certain percentages for expense of doing business before dividing with the salesmen. I firmly believe that considerable progress will be noted toward growth and improvement in these customs during the year 1923.

It is regrettable that this office cannot carry its work into each market and into each establishment with greater frequency of personal contact.

Improvements in methods can only be effected by implanting firm convictions in the minds of merchants that such educational efforts are based on fact and are sound in principle.

In Conformity With the Law

All efforts made heretofore and those yet to be made are and will be strictly in conformity with the spirit as well as the letter of the law. For this reason, progress will be slow. It would be far easier to make arbitrary suggestions for merchants to follow. Quicker results might be obtained thereby. Moreover, such means, or any others bringing quick results, might be more popular with one or two merchants in each market. But in order to justify the

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Engineers and Builders of Pulp and Paper Mill Machinery

Competent Engineers to design, build and lay out Equipment to give you Efficient Operation.

Designs, Specifications and Plans gladly submitted.

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Pumps Agitators Blow-off Valves Acid-proof Bronze
Brass and Lead Fittings

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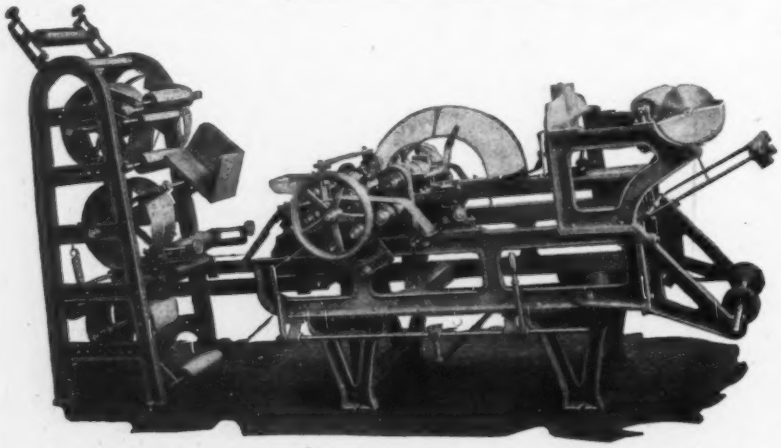
FISCHER-QUALITY FLAT AND SQUARE



Five Stock Sizes for Specialty and Millinery Bags
¼ to 35 lbs.

Sack or Satchel Bottom
Size—1/16, 1/8, 1/4 Bbl.

IN OPERATION 14 Years. Compare low cost of operation and production with competitive machines. ASK THE USER

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avoidance of such proceedings it is only necessary to remember that aside from its legal phases, any program based upon expediency or arbitrary suggestions cannot be constructive nor lasting. If the leaders in each market will hew to the line, sustaining their interest in this work, I believe that by 1924 every wrapping paper merchant will find himself in a better, more stable, more profitable, more ethical, more pleasureful business than he has been in heretofore. From the confidence and mutual respect arising under such conditions, the Wrapping Paper Division can then grow to be a far stronger, more useful body to merchants and to the industry as a whole.

When I wrote this last paragraph, "From the confidence and mutual respect arising under such conditions, the Wrapping Paper Division can then grow to be a far stronger, more useful body to merchants and to the industry as a whole," I had an opportunity of looking over some of the old bulletins of the associations that went back over fifteen years, and I had begun to feel that we were making pretty successful progress in this matter of cost accounting, and much to my surprise I found that this cost accounting agitation that we had been starting up the last year or two, was only a tempest in the teapot compared with the discussions that were held at meetings of the National Paper Trade Association, twelve and fifteen years ago.

Not a New Thing

Mr. Evans, of Cincinnati, and John Church, away back in those days long ago, submitted papers. Mr. Joseph Alling read a paper at the meeting in 1911, outlining a classification of accounts, and you can readily imagine my surprise when I saw that back in 1911 there was a paper submitted, which was exactly right down to the jotting of an "i" and the crossing of a "t," the conclusions of the committee, of which Mr. Cree was a member, came to two and one-half years ago. That was reflected in Mr. Cree's connection with the committee, but the point I bring out is that this cost accounting thing is not a new thing with the association, and I am not so sure that we have made an awful lot of progress. I can see some progress here and there, but with all of this agitation that went on ten or twelve years ago, and so comparatively few houses having benefited or followed the plans and suggestions made at that time, I still think we have got an awful lot of work ahead of us.

During the past years I have been in practically every market east of the Rocky Mountains, from Boston down to New Orleans. The practices which are being introduced in various markets have shown a very satisfactory change. I would say that in every market the majority of paper merchants now give their salesmen selling prices, arrived at from their own invoice costs, plus freight and hauling in, with a definite markup for such quantities, running from 100 pounds to 250 pounds, up to tons out of stocks.

During the coming few months, shortly after this meeting,—during the coming six months particularly,—the work of the cost accounting bureau will be confined largely to the Wrapping Paper Division of the association. About, I guess, since last November, I have been spending most of my time with the Wrapping Paper Division, and I think that with conditions as they are,—I mean business conditions the way they are,—I really feel optimistic with regard to the adoption of certain of these fundamental principles of conducting a business. I feel quite confident that by January 1, 1924, the wrapping paper merchant who gives his men cost price and permits the salesman to use his own judgment will be an exceedingly rare party.

If there are any questions that any of you gentlemen would like to ask, I would be glad to answer them if I can. (Applause.)

MR. HIGGINS: Two gentlemen from Chicago evidently forgot to sign their names to these certificates. If anybody from Chicago did not sign, I would like to have them sign these, otherwise I will turn them in.

MR. POWER: Is there any general business to come before the meeting at this time? If not, a motion to adjourn is in order.

MEETING OF THE FINE PAPER DIVISION

The Fine Paper Division of the National Paper Trade Association met in the Astor Gallery of the Waldorf-Astoria at 10 o'clock Wednesday morning, April 11, Ross P. Andrews presiding.

MR. RIDGWAY: Gentlemen, will the meeting come to order. I regret to announce that Mr. Fritz Lindenmeyr, the vice-president in charge of the Fine Paper Division cannot be with us this morning, as he was compelled to leave for England on business, last Saturday. With the consent of this body I would request that Ross P. Andrews be requested to preside at this meeting. Those in favor will please signify by saying "Aye"; opposed "No."

(Unanimously carried.)

MR. ANDREWS: Gentlemen, it is a rather short notice, but I will do the best I can. Thank you very much.

Gentlemen, the first order of business is the report of the Vice-President in charge of the Fine Paper Division, Mr. Lindenmeyr. The Secretary will read Mr. Lindenmeyr's report.

Report of Vice-President

Mr. Lindenmeyr's report was read by Mr. Ridgway, as follows:

Since the last meeting here at the Waldoorf a year has passed and many of us will agree that it has been a year full of activity in the paper industry. A year that has, if I am not mistaken, taught us, who are in the merchandising end of the business, a great deal, and a year in which much should and has been accomplished. Our Association has been particularly active and I feel that we can look back on much improvement which, in a large measure, will compensate us for the grief and worries that we have been through as a result of the war and its after effects.

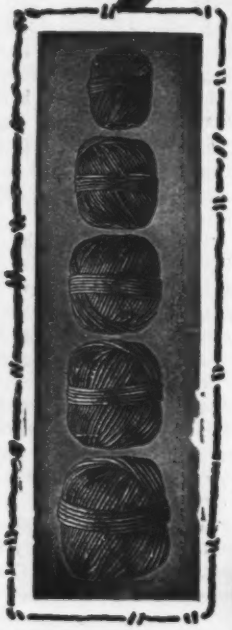
At the time of our October meeting, the general feeling was one of optimism and everybody was looking forward to a gradual and a healthy increase in the volume of business which has become a realization in recent months, so that the feeling today is one not necessarily of extreme satisfaction, but one of a decidedly more comfortable nature. The situation, nevertheless, needs watching. Let us not rest on our laurels. There is still a great deal to be done and in laying out the program for this meeting we had in mind the preparation of papers on those subjects which might at this time be helpful to the merchants in solving some of the problems that confront us. My experience is that as fast as we finish one job and think we are through, another and still larger one confronts us. It is a case of continuous close application of each member to his business and also of lending his best efforts and support to his local association, which is trying to remedy those conditions that need adjustment. Co-operation to the fullest extent each with the other is essential to correct any abuses that may exist, no matter what they may be. I will not go into the details at this time of what has been accomplished by our Association, as you are all familiar with its work, but it has done well.

I feel that I can do nothing better at this time than to read quotations from an address made in February, 1912, by the late Mr. E. U. Kimbark, the fourth President of our association. When you read his statements it seems unfortunate that many of us did not have the opportunity to be closer to Mr. Kimbark in recent years. His keen wisdom and his foresight are plainly pictured in the quotations I am going to read. They show the close student Mr. Kimbark was of his business and those of us who knew him could not help but admire his quiet, dignified manner of speech which, at the same time, was most forceful and convincing.

Extracts from Mr. Kimbark's Address

He said, "I have often suggested to you that the paper jobbing business ought to be established on a broader basis. That is to say,

"AMERICAN"



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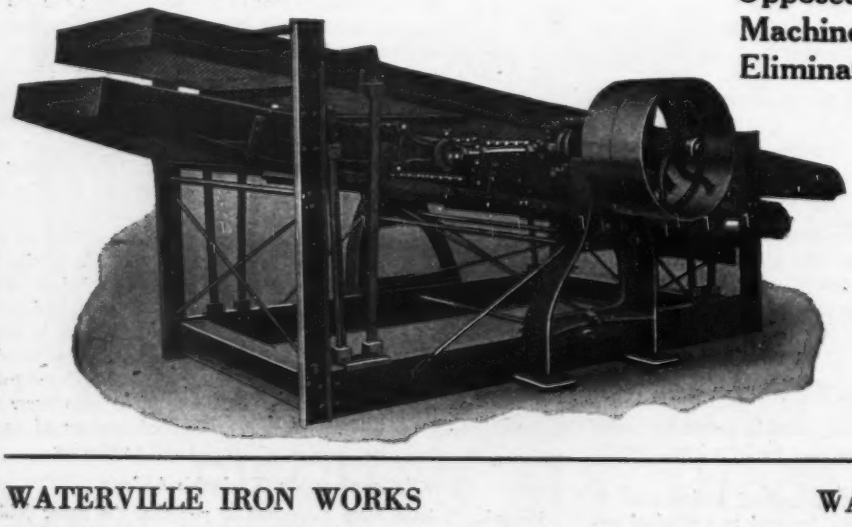

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the paper dealers of this country are, in my opinion, inclined to consider each order or transaction specially, or in other words, instead of having certain fixed prices for the merchandise which will apply to certain minimum and maximum quantities, they seem to leave to the judgment of the salesmen the question of fixing the price on practically every order. If they would devote the same attention to establish a standard for their prices, the result would be not only very satisfactory to the individual dealer but to the trade as a whole.

"As you know, the paper jobbing business is, in a very large sense, a retail business. The goods go out in small quantities, the smaller orders, of course, bring the larger ones, but on the other hand, the large orders on the plan I have suggested would be filled at the quantity price. If we are largely retailers it seems to me there can be no mistaking the fact that we must recognize it in the handling of our business. It would be impossible for a large retail establishment to conduct business with a variety of prices for the same article. In other staple lines of trade, such as dry goods, groceries and hardware, you will not find variations in prices as you will in our business which is just as much a staple business as any of the others. I have long been an advocate of the net price list and our own company has published such a list for fifteen years.

"If every dealer in the United States had the courage to print his prices and stand by that we would all be better off and I am sure would do just as much business as we are now doing. It has been our experience that very few of our competitors make any attempt to cut the prices which we openly publish in our list and I believe it would be found that the trade would, of their own volition, respect the published quotations if they were generally used.

"I want to say that there are two distinct classes of business men and businesses—the little, big men with little, big business and big, little men with big, little businesses. I have more respect for the old-fashioned peanut-stand man who, in my opinion, conducts his business on correct business principles with his cart on the same corner year after year, selling a good quality of peanuts at a standard price, regardless of the intermittent appearance of the man on the opposite corner offering a larger bag of inferior goods at the same price, or throwing in a banana with every five cent bag of peanuts, than I have for the little, big business house which does not do business on correct business principles.

"The demands of our customers, the trade, are becoming more complicated and exacting. Conditions and facilities in the matter of delivery and supplying goods, as well as the variety of our stocks are becoming more and more of a burden. We are practically compelled to adapt and supply department store facilities. In my opinion, there is no way to avoid this sort of thing, consequently, the traffic should be made to bear this increased expense and the expense should be recovered by us in profits along lines of the least resistance as far as possible.

"There remain, in my opinion, but two concrete things that can be accomplished by this organization beyond what we have already accomplished. One is, the securing of a greater differential between the full package price and the quantity price which we, as jobbers, place upon our merchandise. My point is that we have been in the habit of making the full package price as low and, perhaps, a little lower than we have conscientiously felt we could afford to sell the goods for and from this price we have been forced to make the quantity prices. I believe that, as a trade, we should secure a larger difference between our quantity price and our full package price. The man who buys a quantity is entitled to a less price than the man why buys a smaller quantity and there should be a sufficient differential to cover the increased cost of handling the smaller quantity. By smaller quantities I do not refer to broken packages."

Gentlemen, if you stop and carefully analyze Mr. Kimbark's words, you will see that much of what he predicted has come to be a fact. The improvements in the merchandising end of the paper business lie within our hands and while I want to sound a warning of caution and conservatism, don't let us get these terms confused with one called "fear."

MR. ANDREWS: Gentlemen, we will have the report of the Secretary, Mr. Ridgway.

Report of the Secretary

MR. RIDGWAY: This report will cover only those matters pertaining exclusively to Five Papers. Subjects of general application to the industry as a whole will be touched upon at the meeting of the entire association this afternoon.

In our humble opinion, the National Paper Trade Association, in the nineteen years of its existence, never performed a greater service for its members than it did a year ago in presenting the facts as to the large proportion of small orders and the inadequacy of prevailing mark-up on such business. When Mr. Schoenbucher first presented the figures showing that approximately 60 per cent of the total number of orders filled by the average paper merchant from stock was for less than $10.00, and that practically all such sales were made at an actual loss, many merchants were sceptical, but analysis of their individual businesses fully confirmed the statements made. We have always had a conviction that there are few men in business, including those engaged in the distribution of paper, who would knowingly do business at a loss for any considerable length of time and the happenings of the past year would seem to prove the correctness of this conviction. Within a short time after the meeting of a year ago, the need for some change in method was universally recognized, and here and there the more venturesome individual was applying what, to him, seemed a remedy. At the present moment, the plan of decreasing the mark-up of the case, or wholesale unit, and increasing the mark-up of the ream, or retail unit, seems to have been accepted by a great majority of paper merchants as the method best calculated to place the merchandsing of paper on a sounder basis.

Time alone will prove whether this method is the remedy, but without question it is producing results at least better than were being obtained a year ago. It undoubtedly has not placed the sale of less than $10.00 on a profitable basis but in an industry, which does not permit of each sale carrying its proper profit, but must depend upon an average profit, it has more equitably distributed over-head over the smaller and the larger sale.

The National Paper Trade Association in having turned the search light on the unfavorable condition, is entitled to no inconsiderable credit for bringing about improvement even though not directly responsible for the new method by which this result was accomplished.

The "Long Price" List

The "Long Price" List question remained dormant from April of last year until January of this. Apparently the idea lost favor steadily during that period. Long Lists which had been issued by merchants outside of the association membership were discontinued, presumably for the reason they had not produced the results which prompted their issuance, until, at the beginning of 1923, only a few such lists were in circulation. In January of this year, there were a few rumblings in an outlying district or two of an impending renewal of the agitation, and about the middle of that month the United Typothetæ of America published as a part of its weekly Bulletin a long list of mill marks without listing the agents.

We are pleased to record that the manufacturers of mill marks recognized that the United Typothetæ of America in so publishing a long list had switched the attack from the merchant to the manufacturer, and almost as a unit they protested vigorously. Apparently they also realized that mere protest would not be effective with the United Typothetæ of America, and that affirma-

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tive action was necessary to convince the small element back of the long list demand of the sincerity of their protest, for practically all of the manufacturers of mill marks notified their agents throughout the country of their preference for net listing. In so doing, they clearly indicated that they too were thoroughly alive to the dangers to the paper industry of the long listing of papers. We cannot but express extreme satisfaction over the united front which the paper industry now presents on this issue.

We are creditably informed that as an incident to the action of the manufacturers, the long list is about to be withdrawn in the one city in the country where it was an apparent success. We venture to predict that the business of both printer and paper merchant in that city will be as profitable and will run as smoothly with the net list in vogue as it was with the long list. Recent editorials in the United Typothetæ of America Bulletin would indicate an intention on the part of that organization to continue the agitation, but with the manufacturer and merchant allied in opposition, we fail to see how it can be at all successful.

Campaign for Mill Marks

Coincident with the publication of the long list of mill marks, the United Typothetæ of America again took up the campaign for mill marks as against private marks, which had accompanied their efforts a year ago to force the long list upon the merchant. In a recent editorial in the United Typothetæ of America Bulletin, the question is asked, "Is there any one among us so innocent that he does not know that the private brands of the paper jobber are so numerous and pushed with such vigor that they bid fair to sweep the market unless the printers get up and cry a halt?" To this question we should like to reply by asking another: Is there any one among you so innocent as to believe that the paper manufacturer needs a nurse?

While we are on the subject of mill and private marks, we desire to make an observation or two. The good-will value of any trade mark increases in proportion to the growth of the demand for the trade marked article but the monetary value attached to the good-will accrues almost exclusively to the owner of the mark. As the fine paper business of the country is now being conducted, good-will value is being built upon both mill and private marks, but in no instance within our knowledge do manufacturer and merchant share in the monetary value which attached to the mark. This value accrues either to the merchant on his private brand to the exclusion of the manufacturer, or to the manufacturer on a mill mark to the exclusion of the distributor. Neither result would appear to be entirely equitable, for both manufacturer and merchant contribute to the building up of the demand for any particular mark under the methods of distribution now in vogue.

It is quite easy to understand how the manufacturer of mill marks can view this situation with complete satisfaction for they have everything to gain and nothing to lose so long as present methods continue. It is difficult, if not impossible, to understand the attitude toward this subject of the paper merchant. He apparently is entirely satisfied to contribute both effort and money to the building up of any mill mark entirely regardless of the fact that he does not participate in its good-will value and that he has no real protection in his agency for the mark. He would seem to be content with the present and to be unwilling to take a peek into the future to ascertain where he is likely to find himself ten years hence, if present tendencies follow through to a logical conclusion. To our feeble intellect, he could well afford to retire to some quiet spot and there try to answer that oft repeated and well worn question, "Where do we go from here?"

About the Future

We do not believe any good purpose would be served to here set out what we believe is the answer. However, we do believe that no straight thinking paper merchant can give serious and thorough consideration to the question without reaching the conclusion that he is not going to occupy as important a pisition in the industry ten years from now as he does today, if present tendencies follow through. We would also like to call attention with considerable emphasis to the fact that with each succeeding year, it is going to be harder to direct present tendencies so that the position of the merchant in the paper industry may be maintained. Our main reason for bringing this subject to your attention at this meeting is because a most forceful presentation of it at the fall meeting in Chicago, judging from visible evidence, fell on barren ground. We wonder why?—and are forced to the conclusion either that we are wrong or that the paper merchant of the country is an opportunist and doesn't care what the future holds for him.

MR. ANDREWS: Gentlemen, we will have the report of the Statistician, Mr. Pape.

Statistical Report

MR. PAPE: Gentlemen, for the benefit of those who heard my short report yesterday, I want to say that my report to you is not going to be a whole lot different from what it was yesterday. Outside of certain facts and figures, what I have to say is applicable to either division, and I have not any idea of making it appear different.

The most important happening in the statistical department during the past year, from my standpoint at least, was the resignation of your former statistician, Mr. Farrar, after nearly four years of service, and the selection of myself as his successor. It would be strange indeed, in such an occurrence, if the new man did not have some criticism to make of existing methods and did not have some ideas of his own as to certain improvements that might be made or at least tested out.

The particular case in question is no exception to the rule. It is, however, I am glad to say, more a case of making certain additions to the existing structure rather than tearing down what has already been built up and rebuilding. To carry the analogy further, a few touches will be added here and there to make the building more attractive or more useful.

There is one circumstance that affords considerable satisfaction and that is the fact that we have continuous records of a comparatively large number of members from the time the statistics were first compiled until to date. Since the aggregate number is large enough to be fully representative of the whole trade, this means that we have a complete history of the trends and fluctuations in the paper trade for four years. We have for example, to take something very recent, an actual record of the exact extent to which members were actuated to make purchases during January, 1923, in anticipation of price increases.

The number of members whom I have referred to as reporting regularly and who are now reporting is 51. In addition to these are six who started reporting later. This makes a total of 57 members and, with four members who temporarily discontinued reporting and three who have signified their intention to report, there should be at least 64 reporting members during the coming year.

A Few Comparisons

In view of the short time during which I have been connected with the association, you are doubtless all more familiar than I am with the Fine Paper statistics and I am not going into them in any detail. Just a few comparisons, however, which I have made of purchases and sales during the three years of 1920, 1921 and 1922, and the first nine months of 1919, may interest you. Expressed in terms of percentage of normal they are as follows:

	9 mos. of 1919	1920	1921	1922
Writing—				
Purchases	101	107	55	89
Sales	78	102	70	87

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More than 100 of these instruments are in the hands of paper mills, who specify the density of their roll coverings by Plastometer readings.

We should like to see a Plastometer in the hands of every mill, and for that reason we have decided to offer 100 instruments at a greatly reduced price. This offer to hold good for thirty days.

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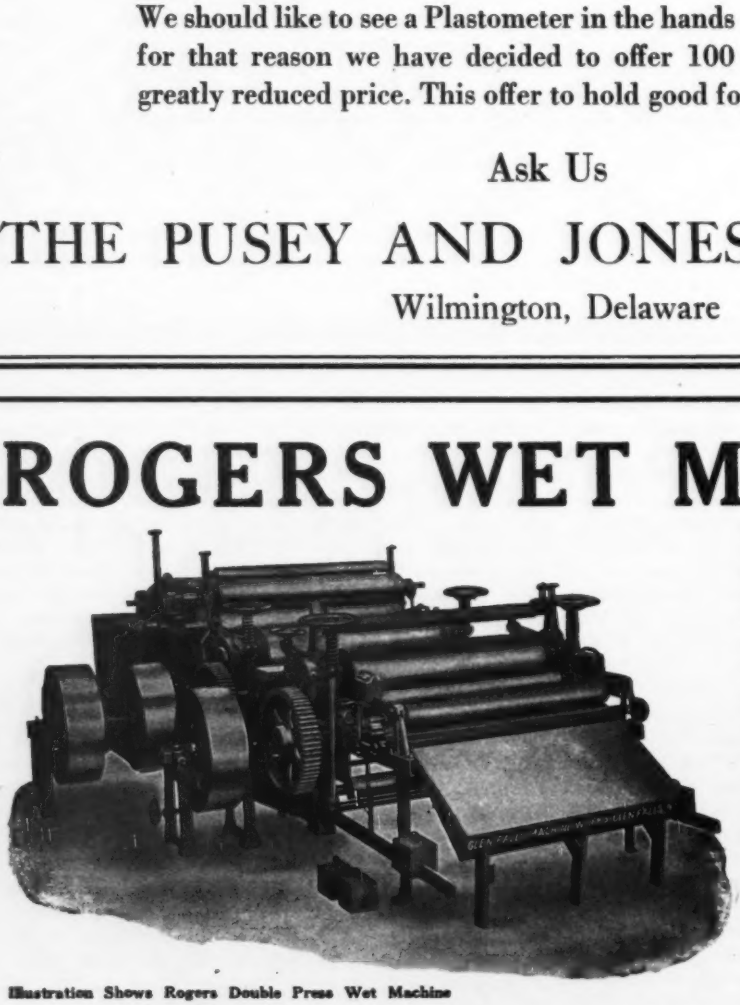

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FOR CHEMICAL PULP—including Sulphite, Sulphate, Soda, also Cotton and Waste Paper fiber.

TYPES—Single and Double Press 72" wide.

CAPACITY—either type 25-30 tons air dry stock per 24 hours.

SHEETS produced by the Double Press Machine uniformly 48% dry. By the Single Press Machine uniformly 40% dry. There is no fold to contain excessive moisture. Sheets are handy size, 33"x36", and are folded once into most convenient bundles for storage, for the beater or for shipping. By this great capacity, high dry test, small amount of floor space per ton pulp produced, exceedingly low cost for labor and maintenance, users are assured that the machine will completely pay for itself within one year, and are promised a handsome return on their investment.

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Book—				
Purchases	104	104	55	84
Sales	91	107	76	94
Cover—				
Purchases	163	95	58	88
Sales	137	95	69	89

I am not going ahead any further along this line but I am going to promise you that some interesting statistical information will emanate from the statistical department this year. All I ask of you is that before you cast my memoranda into the universal file, look them over and see if they don't contain a few facts that are worth knowing. Thank you. (Applause.)

MR. ANDREWS: I wish to announce that we are going to have quite a treat, an address on some of the problems of cost distribution by Mr. O. A. Dolge, of Henry Lindenmeyr & Sons.

Address by Mr. Dolge

MR. DOLGE: Mr. Chairman and Gentlemen: This address, so called, is rather a lengthy proposition, and it is one that I am not going to attempt to tell you. I am going to read it to you, with your permission.

Cost of Doing Business

About two weeks ago, the call came to me to prepare a paper on the subject of "Some problems concerning the Paper Merchants Cost of Doing Business" for this meeting. I am told that this task came my way largely because the company, with which I am associated, has done considerable research work in connection with these problems during the past fifteen months. Under these circumstances, I trust that you will consider that I stand before you more in the sense of one who is still seeking solutions of the common problems of the paper merchant than as one who has found such solutions. It has been a rather difficult thing for me to decide in my own mind exactly what the central theme of this paper should be, and instead of preparing the subject matter from mind pictures or fanciful ideas for the future, I have as you might naturally expect, followed the course of least resistance and set down the subject matter somewhat in the manner by which we have approached it in our own business.

We are all fully cognizant of the fact that those engaged in the field of distribution generally have been subjected to criticism for a long time. It is commonly said that the cost of distribution is too high and must be reduced. This has even been said on one or two occasions in connection with paper merchandising. I cannot willingly admit that we are to assume a defensive attitude in this connection. We will all agree, however, that paper merchants can well afford to examine their own businesses with the view of bringing about constructive improvements and economies in distribution. I am not prepared to state that the cost of distributing paper cannot be materially reduced, but I do feel that, under the methods and practices now in vogue, it is exceedingly difficult for any merchant to effect very substantial or spectacular savings. Furthermore, if five per cent net profit on sales is the ideal toward which paper merchants should strive, then substantial economies will be necessary to reach even that figure, for I am told that most merchants failed to earn more than one-third of that percentage last year. Let us, therefore, look into the expenses incurred in the sale and distribution of paper so as to find ways and means by which every economy may be effected, be such economies ever so slight, for improvement in our net position must come from many small economies rather than a few large ones. In this analysis, I have set down the expense factors in the order in which they appear in the accounting classification of the association.

Warehousing Conditions

There are unquestionably many paper warehouses which are not ideally suited for the warehousing and handling of paper. This condition would probably be found in connection with every other industry so that no specific criticism may be directed toward the paper merchant for this condition. Moreover, in many instances, the paper merchant occupies quarters which, while not technically ideal, are, nevertheless, economical in net cost because of high rents and the high cost of construction for new buildings today. It is well for merchants to realize that space is usually paid for on the basis of gross area, and that in many instances not more than half of this area is actually used for the storage of paper, the other half left is divided into elevator shafts, space in front of the windows, aisles, stairways, pillars, and so on. Occasionally, merchants, in attempting to apply the cost of distribution to various departments of their business, charge certain departments with the floor space occupied. It is well for those who make this test, to remember that gross space must be used as a basis for charging rent, and not net space. It is also well for those in leased premises to consider what the renewal rates will be when present leases expire. Is it possible for you to reduce this expense item say fifteen per cent by a better layout of stock and also perhaps by a discontinuance of unprofitable lines of merchandise? Even though you cannot, or perhaps care not, to sub-lease to others any space so gained, is it not well to have it appear as space anyway—a sort of constant reminder of one small leak to be plugged in some way?

By a careful follow-up of fluctuations in value or quantity of goods on hand, considerable savings may be effected and more complete protection can be obtained in insurance coverage. Moreover, I believe that there are many merchants present who could with considerable profit, immediately upon their return to their establishments from this meeting, invite their own insurance broker, or other competent authority, to make a survey of their own warehouse with the view of making certain slight improvements which might very readily effect savings in insurance premiums of an amount equal to the net profit on $15,000 or $20,000 sales. I have in mind an instance where the posted rate on contents was 4.34 per 100 and was recently reduced to 1.29 at an expense of approximately $500 for repairs.

The Matter of Lighting

In connection with this item, I wonder how many of you have ever considered calling in the lighting expert of your local electric light company to go over very carefully your present lighting system. This advice will cost you nothing, and might easily result in a saving equal to the net profit of another $10,000 or $15,000 of sales depending on the possibilities of improvement and the size of your establishment. The type of fixtures and their location are of important consideration in respect to economies on this item. How many K. W. hours are wasted daily by having lights turned on unnecessarily? It is to be assumed that there was no fuel wasted by merchants this year because of the coal shortage, but even here, it is well to consider whether or not it is possible to effect a saving of from 5 per cent to 10 per cent of your actual fuel bill. There are many ways of conserving fuel, all the way from weather stripping to thermostatic heat control. One of these ways will apply to you.

Equipment ordinarily used to expedite the handling of paper in an economical manner consists of skids, trucks and tiering machines. By using skids, on which to pile cases, you reduce the water damage risk in the event of fire, and thereby reduce your water damage insurance rates. The nature of the use of trucks and tiering machines is obvious. A few dollars spent for such equipment, on which depreciation is very slight, will at least make your operatives more effective. If your establishment is large enough, actual labor savings could also be effected. In connection with the subject of handling facilities, it is well to bear in mind that economy space brought about by establishing aisles too narrow, might very often be more than offset by loss of time in getting out orders.

Many merchants are located in old warehouses which have

Let Them Drink to your business health in cups you sell

each drink a cup—each cup a sale for you and at lowest cost of any cup on the market.

At such prices SALES RESISTANCE IS NEGLIGIBLE and our direct advertising assistance in your city will get immediate results as it is now doing in many cities.

Burt's Paper Drinking Cups are made of fine white paper, without wax to make drinks taste, and are reinforced so holders are not necessary. They are kept under glass and cannot be wasted or soiled before use.

Cups retail at one fourth cent—dispensers at five dollars.

F. N. Burt Company, Ltd.
Paper Cup Division
Buffalo, N. Y.

MODERN FAIRY TALES

Once upon a time a man bought a ten thousand dollar automobile, and after using it for a couple of weeks he put it in the garage and said—That's a great car—I wish I could afford to buy enough gas to run it.

Perhaps you have a machine room ventilating system—well laid out—efficient—and amply large—but when the weather gets down to zero or below and it eats up the steam till you think the head of the boiler is gone you just can't afford to feed enough steam into it to keep it going.

Do you realize there is enough vapor going out of your machine stack to supply most of this heat instead of using steam?

A "Briner" Economizer (patented) will enable you to utilize this waste heat.

We would be glad to give you full particulars.

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extremely high ceilings. It is a mistaken idea to take full advantage of such high ceilings either on the ground or basement floors by stacking the cases 10 or 12 feet high. Cases of book paper tiered 4 or 5 high, and bonds and writings 3 or 4 high, depending upon the height of each case, is as high as any stacks of cases should ever be and should always be based on floor capacity per square foot. If conditions would permit, I would never stack cases over 8 feet high.

Eliminating Waste Motion

Careful consideration should be given to the location of the packing tables so as to eliminate waste motion and loss of time. Some houses locate their packing table on the floor which contains the items which are most frequently sold in less than solid cases or original bundles. Other houses locate the packing table somewhere close to the shipping department. The physical layout of your warehouse and the peculiar conditions surrounding your business will determine the best location for you. Some papers require packing in frames, as you well know, and if you can make some arrangement with your printer customers to purchase from them any frames which they may have lying around in their plants which have been used on previous shipments, and, thereby, cut the cost of frames in half, or better. Do you draw most of your packing materials from your own merchandise stocks? If so, how much waste is going on?

I presume that most paper merchants use delivery bins in laying out their city and freight deliveries. Here again the matter of location is of importance, but in this matter, the solution is so obvious that hardly much more need be said.

Cutting machines are made much more productive if their proximity to the stock cut most frequently is what it should be. Certain concerns which I know of, turn out orders in one part of the floor and load them on flat trucks. These are rolled around to the cutting machine, and when the cutter has completed his work, he passes the cut paper directly to the packers table. After this operation is completed, they are sent directly to the shipping department with very little lost motion.

Experience ratings play an important part in the final adjustment of compensation rates, and it is well for all of us to keep close tabs on this with our brokers to see that we are given the rate we deserve based on total claims made during the current year. In this connection, it is my opinion that merchants could bring about lower rates by an exchange of experience information. If in order, I hold out the suggestion that a committee might be appointed to look into this matter.

Many merchants still use horses for both "in" and "out" deliveries. The cost of operating and maintaining teams as compared with auto equipment has probably been carefully investigated by all who still use teams. Those who operate both horse drawn and automotive equipment might well, however, consider carefully standardization on automotive equipment. Such a step might easily result in economies which would more than offset any slight increases in a few single items of expense.

The electric truck has proven itself far superior to the horse truck and horse drawn vehicle on short haul work. I believe it to be the most economical means of transportation under many, but not all, conditions. The maintenance of electrics is far lower than that of gas cars. Insurance is also considerably less. In purchasing any equipment, a man, who thoroughly understands your requirements should plan the type of body best suited to your needs. Many dollars are saved by being able to load units to the best possible advantage. Depreciation rates for electric trucks are commonly as low as 10 per cent.

These, of course, are best adapted for long hauls. Maintenance, insurance and depreciation are all proportionately higher than electric. Therefore the type of gas cars must be carefully considered from the standpoints of unit, size and cost, and also body type. On long distance hauls, pneumatic tires reduce wear and tear to an extent usually sufficient to more than pay for their extra cost. Depreciation rates on gas trucks commonly run from 20 to 25 per cent per annum. It is likely that many merchants possess no adequate check on the gasoline and oil used in mileage and small tools consumed. I know of only one effective way to minimize operating expenses of any delivery system and that is to provide the right kind of supervision. Some merchants may operate both horse and wagon and gasoline truck delivery units in the belief that horse and wagon units are more practical and economical in the congested districts. This may be true on the surface, but every merchant should give careful consideration to economies which could be effected if their entire delivery units were standardized on motor vehicles than by having both classes of units. To illustrate—a merchant may have three gasoline trucks and four single or double teams. With these three gasoline trucks, it may not pay him to provide for careful supervision over the consumption of oil, gas, tires, tools, etc. The stable man in charge of the horses would hardly be competent to perform such supervision, and furthermore, it is usually necessary to have the garage and stables separate. I was told not so long ago of a company operating both team and automobile trucks, which upon careful investigation, concluded that by replacing the team units with motor trucks, it would be practical for them to operate their own repair shop. The aggregate savings resulting from closer supervision and making their own repairs subsequently amounted to a very substantial sum. Careful routing of delivery units, scheduled trips and the avoidance of overplaying service are also vital factors which determine delivery costs. These elements are worthy of much thought and careful consideration.

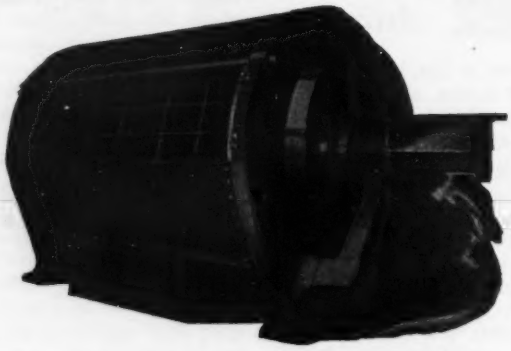
Effectiveness Rather Than Economy

The selling expenses of paper merchants taken collectively is one of the important groups of expenses concerning which a book might easily be written and yet leave much unsaid. The keynote in connection with these expenses is effectiveness rather than economy. Effectiveness, of course, produces economy. The opportunity for the display of courage and good business judgment exists to a greater degree on this group of expense than it does on any other. The day has passed when it is considered dignified to purchase business and good-will by means of gratuities. In fact, such practices may often be altogether illegal according to Federal laws. Numerous houses have provided their salesmen with automobiles on some basis or other. While I consider that there is, no doubt, justification for the use of salesmen's automobiles under some circumstances, I am wondering whether this practice has not been considerably overdone by some merchants. I have a personal feeling that whenever in doubt as to whether the use of an automobile by any salesman might be profitable or not, it is better not to provide one. If merchants would study comparative results, such problems as these could be solved easily because where a salesman has been provided with an automobile, and his increased effectiveness does not warrant the additional cost of operating an automobile, some other use should be found for it. It is important to make these comparisons from time to time in order to know whether the merchant is getting the maximum return from one method or the other. In connection with selling expense, perhaps the most important matter for consideration is the compensation of salesmen. This, in itself, is a very broad subject. From conversations I have had with others, I am confident that some interesting and sound plan will be developed during the next year which can be adopted by a great many, if not all, paper merchants. This much can be said at this time, namely, regardless of the loyalty of the salesman to his house, I believe there are certain inherent traits in all human nature which make it desirable for men engaged in sales work to be given some incentive, which becomes immediately effective whether they accomplish results

"IMPCO" TAILING SCREENER

FOR SCREENING GROUND WOOD TAILINGS

Very Low Power and Upkeep Expense



Delivers Rejections Free from Good Stock

ANOTHER UNIT OF OUR CLOSED SYSTEM FOR PULP SCREENING

WRITE FOR FULL DETAILS *CORRESPONDENCE A PLEASURE*

IMPROVED PAPER MACHINERY CO. **Nashua, N. H.**

SHERBROOKE MACHINERY CO., LIMITED, SHERBROOKE, CANADA

R. J. DOWD KNIFE WORKS · EST'D · MACHINE KNIVES · 1847 · BELOIT WIS

Better Paper— More Profit

R. J. DOWD KNIFE WORKS · EST'D · MACHINE KNIVES · 1847 · BELOIT WIS

Cluster filling is manufactured to fit any style bar filled roll.

result when using the Dowd Patent Cluster Filling in your beater engine rolls.

With a brushing surface over 400 per cent greater than has the bar filled roll you can produce a stronger and better formed paper.

Dowd Cluster Filling is being used in some of the Most Noted Mills in the country and giving excellent results.

An installation will convince you of the advantages to be obtained in using this filling.

Further information and prices gladly given on request.

R. J. DOWD KNIFE WORKS

Beloit, Wis., U. S. A.

Manufacturers of high-grade Beater Roll Bars, Beater Bed Plates, and all styles of Machine Knives used in the manufacture of paper

New York Office, 50 East 42nd St. Phone, Vanderbilt 6864

above par or below it. Many houses have followed the custom of assigning accounts from salesman to salesman as one or the other fail to make headway with particular customers. This condition grows to a point where eventually a salesman's customers are so widely scattered that he cannot make maximum number of calls in a day. The next step after this is to provide the salesman with a car to cover such a crazy patch territory. Such a situation is a serious indictment on the calibre of sales management displayed by the head of the house or the sales manager.

Spasmodic or artificial stimulation of salesmen's efforts is never constructive or lasting. The same effort and attention directed towards a very careful analysis of the layout of his territory and his relation to his customers will produce far more productive and lasting results, at less expense, than the frequent offering of prizes for good work.

It is exceedingly difficult to write much on the subject of advertising from the standpoint of economy. The keynote in connection with advertising is always effectiveness instead of economy. About the only thought which occurs to me is that stunt advertising is neither dignified nor lasting in its effects. Money spent in such a manner usually is entirely wasted. Considering the important influence of advertising, it has always seemed a pity to me that the paper merchant has not been in a position, by his low margin of gross earnings, to spend more for advertising than he now does. I would like to see the day come when the paper merchant could well afford to spend wisely an amount equal to at least 2 per cent of his total sales in such a creative manner as to increase the consumption of paper for various purposes.

Three Angles of Approach

This group of expenses may be approached from three angles:

First—Its personnel.

Second—Location of the office and the various people in it in relation to one another.

Third—Supplies used.

Increasing importance is being given to the details of management and there is a growing need for the executive head of every office, whether he be accountant, treasurer or what not, to be capable of not only analyzing the business in an intelligent way, but to do so in an economical way as well. I here and now make a plea with every merchant to encourage his accountant to delve into the figure facts of his own business, and to sit in conference with him at least once a week for half an hour or an hour. I feel confident that the effect of such an interest on the part of the head of every house will produce surprising results both in the display of ability and the facts provided by the accountant. In many offices of paper merchants, there is a surprising lack of knowledge of the technical phases of paper such as kind of paper, size, weight, etc. Aside from the fact that this is wholly undesirable, such people never feel that they are actually engaged in the paper business. I feel confident that every office assistant will be more valuable in his or her work if they possessed a reasonable familiarity with these details. Furthermore, in the buying and also in the billing end of office work, which requires a certain amount of technical paper experience, occasions may arise when other office people may be obliged to substitute and to fill vacancies in these departments.

Needless to say, the office should be located with due consideration to quietude from noises and away from interruptions from the sales department, and in such a manner as to permit a consecutive flow of work from the order desk to the billing department, to the shipping department, to the bookkeeping department. The average office, in none enterprises out of ten, both in the paper business and out of it, has been given too little thought and attention. From observations and discussions, which I have had with others I feel quite confident that careful study and analysis will, in most instances, improve the effectiveness of the office force.

Office Supplies

The aggregate moneys expended for office supplies are small in relation to the total expenditures, and yet economies, even though they be ever so slight, may be effected here which might approach the net profit on from $15,000 to $50,000 on sales per annum, depending on the size of the house. The many houses which have adopted the custom of delivering invoices with the goods have found that printers like this practice, and in fact, prefer it over the practice of mailing bills. With an efficient layout and some reasonable arrangement of the work to be done, this does not hold up deliveries. The saving made by delivering the bill with the merchandise is one of the largest items of economy which can be effected by any merchant who now mails invoices. There is hardly such a paper merchant who could not save $1,000—some might save as much as $4,000 or $5,000 per annum by eliminating this needless expense. There are many kinds of office appliances which are designed for various purposes. Many of these appliances offer little improvement over the present methods merely because those performing certain functions have done so far many years, and have become highly proficient in their performances. It is where changes in help and reassignment of various functions are made, and new and untried help is engaged to perform such functions, that the value of many of these new devices are found to be economical and money saving.

This group of expenses is the smallest of all groups making up the merchant's total expenses, and consists of proprietor's salary, taxes, other than income tax, legal and auditing expenses, dues, chambers of commerce, trade associations, conventions, etc. The only item in this group, of expenses which might call for comment is that of the proprietor's salary. As might naturally be supposed, errors are made both ways in connection with this item of expense. I am quite confident that, if Federal Income Taxes had not forced many merchants to do so, there would still be many paper houses operating today with no charge for proprietor's salary included in the expenses. This amount should be neither too small nor too large. Such a statement, of course, is axiomatic. It is one which requires honest consideration upon the part of every proprietor. Where the merchant performs administrative functions only, it might be said that his salary should be from 3 to 5 times that of the highest salaried internal employee. This is a mere suggestion to definiteness in connection with this matter. Where the proprietor is also actively engaged in selling, his administrative salary might well be from two to three times the salary of the highest salaried internal employee, and the compensation for sales actually made by him should be based on something approaching the basis on which the salesmen are compensated, perhaps not quite as much in relation to the total sales because of the composite good will of the house which a proprietor often has the benefit of in making sales, but certainly something around 2/3 of the amount paid to the salesmen for a similar amount of business.

Intangible Losses

We now come to what might be called invisible and intangible losses. I cannot clearly state why I call these losses intangible or invisible, because in effect they are very tangible, for they result in actual dollars of loss in the course of the year with every paper merchant. *First*—We have the problem of returned merchandise. Merchandise is returned only for one of three reasons; either the customer errs or changes his mind; the paper is inferior in color or quality; or an error has been made by someone in the employ of the paper merchant. I have never attempted to ascertain how much of the total value of merchandise returned each year is actually spoiled beyond further use, but the thought has just occurred to me that some time in the near future, I shall make a serious effort to ascertain as much information concerning this loss as it is practical for me to do. I would not be afraid to hazard a guess that

We offer a full line of

COLORS

and furnish precise directions on application for

Beater Dyeing, Staining and Coating

Half a century's experience enables us to furnish goods answering requirements and to give reliable service

THE HELLER & MERZ CO.

BOSTON CHICAGO NEW YORK PHILADELPHIA SPRINGFIELD, MASS.

Becker Paper Corporation

350 Madison Ave., New York, N. Y.

317 Main Street, Springfield, Mass., Branch Office for New England States

DEALERS IN ALL GRADES OF PAPER

Specialists in

BOND AND KRAFT PAPER, GLASSINE, PLAIN and EMBOSSED

Exclusive Distributors for

WESTFIELD RIVER PAPER COMPANY

RUSSELL, MASS.

Distributors of

WATERFINISHED SULPHITE FIBRE, BUTCHERS FIBRE, NOVEL NEWS AND HANGING PAPERS.

Manufactured by

THE BEDFORD PULP and PAPER CO.

BIG ISLAND, VA.

pretty close to five per cent of the total value of the merchandise returned can never be used again, either because the sheets are soiled, torn on the edges, ruffled or dog eared. In addition to the actual spoilage of merchandise, we have the increased expense of the driver calling for the merchandise and the rehandling and duplication of effort throughout the office, which, on each order, amounts to considerable expense. In the absence of actual figures based upon time studies, I, nevertheless, feel that it costs almost twice as much for handling a return sale as it does to handle the original shipment going to the customer. The paper merchants of Chicago are doing some very constructive work along these lines and have adopted rules for the trade concerning return merchandise. They are to be commended for going into this subject so thoroughly as they did.

Another of these intangible losses arises from the great number of fractional parts of reams both on less than ream sales, and on sales of reams and a fraction. Many merchants have found from experience that stockmen are prone to overcount a few extra sheets in order to make certain of a sufficient original count, and have adopted the policy of rechecking such counts. This seems like a heavy expense to me, and I am not prepared to subscribe to its necessity. It demonstrates clearly, however, how costly are these orders which require a count. A practical solution leading towards the elimination of fractional orders, or to a very substantial reduction thereof, is a fertile field for the efforts of some crusading knight. The third of these leaks grows out of the first and second; namely, spoilage of paper by partly exposing it to sunlight or dust. This is another leak which, even in small paper houses, might amount to as much as several hundred dollars per annum.

Importance of Small Savings

The foregoing suggestions merely point in a very general way to certain directions in which economies may be effected, and also incidentally, as you have probably concluded, to the difficulty of effecting any appreciable savings without going over every part of the business with a fine tooth comb. Time has not permitted me to go into this subject as I would have liked to. There are probably 50 or 100 questions which every paper merchant might easily set down on paper for the purpose of self-examining his own business. On some of these, he may conclude to spend more than he has heretofore in order to make a given phase of his business more effective, but on many of these elements of his own business, every merchant may easily find it possible to effect savings from ten dollars to several hundred dollars per annum. The importance of these small savings may be fully appreciated when it is realized that savings of $3,000 in expenses are equal to approximately the net profits which, I am told, many paper merchants earned on sales of $150,000 or $200,000 during the year 1922. This might be further empasized by pointing out that such savings would amount to the net profits received from two or three, or even four, profitable salesmen. In such constructive matters as the improvement in methods of paper merchants and the reduction of expenses in connection therewith, there should be a feeling of entire freedom and co-operation between merchants, both locally and nationally.

While I have gone somewhat into detail regarding the various expense items that go to make up the budget in the average paper distributing house, my object in doing so is to emphasize the fact that savings can be brought about by clipping and watching the many small items instead of expecting to make large savings. I do not think that the amount of expense of distributing a case of paper from the time it leaves the manufacturer until it reaches the ultimate consumer is large, and figured in percentage is really small in many cases. An order was recently placed for a job that took 185 tons of paper, both cover and inside, on which the distributor's profit amounted to $1,390 on $30,500 worth of paper, the finished job amounting to over $80,000, probably nearer $90,000. At the same time the feeling exists that the cost of distribution, generally speaking, is high. Let us, at least, get the paper distributing cost down as low as possible.

I cannot conclude without stressing the point that those who overplay the much abused so called service to the customer are guilty of a very destructive, and in fact, vicious practice. The effect of such abuses often leads a few weak merchants to follow the perpetrator of such practices. Ultimately, all merchants in a given locality are compelled, in self defense, to fall in line and do likewise. The merchant guilty of such a practice is a waster and the industry would be far better off without him.

I will conclude this by saying that if there are any gentlemen present who would care to, during the rest of the week sit down and go into any one of these propositions further, Mr. Schoenbucher and myself would be very happy to give you any time that you might want. Thank you. (Applause.)

MR. ANDREWS: Gentlemen, I just want to say, before I call on the next speaker, that I personally believe that is one of the best papers we have ever had read at one of our meetings. I do not believe there is a man in this room that cannot take that paper and check up on himself and save money.

We are going to have an address now by Mr. William A. Hentz, of D. L. Ward Company, Philadelphia, on "Advertising of the Paper Merchants' Business." (Applause.)

Address by Mr. Hentz

MR. HENTZ: Gentlemen: I feel very much out of place when asked to tell you gentlemen how the paper merchant can advertise his business. For eighteen years I have been studying advertising, its principles and their application; the past six years of my work have been concerned entirely with paper; and it will take me just about the next fifteen minutes to tell you all I know about it.

Let me say very frankly, that I have still to find the royal road to successful paper advertising, nor am I altogether sure that anyone else has found it. We are all groping about, some of us more nearly right than others, but if there is anything in my experience that will be of help to any single one of you, it will make the preparation of this paper quite worth while.

I want to make clear to you that this paper will not be a completed story of a successful advertising careers, nor a set of rules to help you find the proverbial pot of gold. By following out some of these precepts, however, you will surely enjoy more than a reasonable return upon the time and money invested, and what is more—you will side-step a great deal of the sometimes very discouraging experimental work.

When we make up our minds to advertise, about the first question to be raised is, "How much shall we spend?" There has always been considerable discussion as to how to determine the amount of the advertising appropriation. Just the other day I read the statement "the limit is the maximum amount of effective material the advertising department is able to produce." Well and good; but who shall judge in advance the effectiveness of any single piece of copy? If effective, each piece is a mighty good investment and will return its cost many times over. But unfortunately, some messages fail to hit the target, and without a suitable control, too many of these might creep into the campaign resulting in a far greater expenditure than at first anticipated and a much smaller return for each dollar invested.

Personally, I believe that a definite sum should be set aside, but just how this figure should be decided on, I can't discuss—for honestly I don't know. Some houses believe the correct way to be an appropriation dependent upon a percentage of sales; others a percentage of profits; still others name a certain sum that they are willing to invest in advertising.

Work Should Be Planned in Advance

I think a better way is to plan in advance the work that is needed in the various lines of merchandise, being sure that you have in-

Vortex
DRINKING CUP
(Patented)
June 20, 1916, Reissued June 13, 1922; March 26, 1918; April 18, 1922; Other Patents Pending
Canadian and Other Foreign Patents Granted and Pending
"One who manufactures, who uses, or who sells a device that infringes a patent is equally an infringer."
Look for our trade-mark "VORTEX" on all cartons and tubes

THE VORTEX SELLING SEASON

IS ALWAYS ON

Wherever Vortex Service is used—and the demand for VORTEX service is continually growing—there is an active steady market for VORTEX drinking cups.

Theatres, dispensaries, hotels, clubs, banks and offices are complying with state health laws or acceding to public opinion by installing VORTEX Sanitary Drinking Service. The VORTEX cup is better, and you can sell it for less.

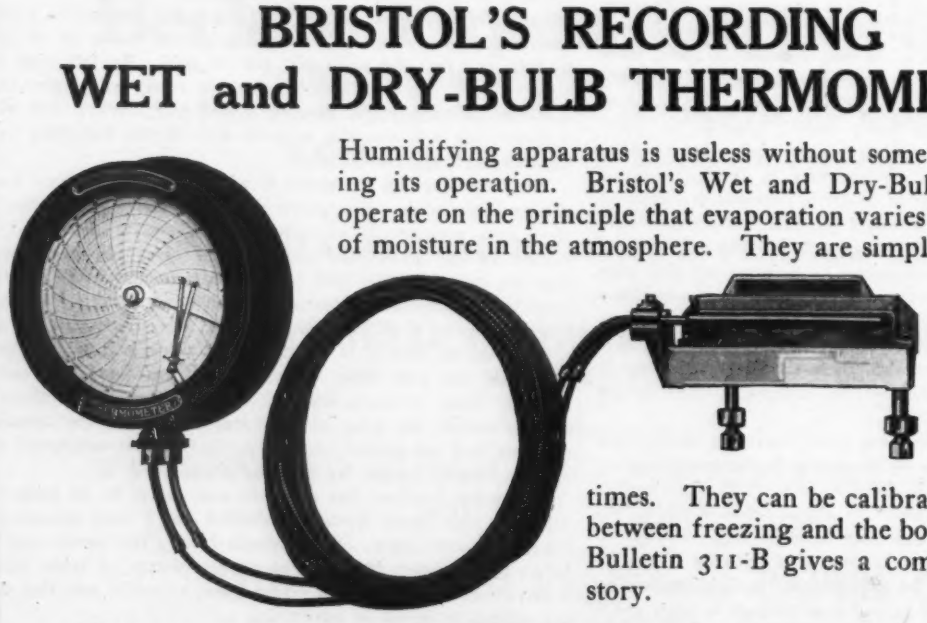
—

THE VORTEX MFG. CO.
421-431 N. Western Avenue
Chicago, Ill.

Canadian William A. Rogers, Ltd., Toronto, Manufacturer and Distributor for Canada

Vortex
Drinking Cups

BRISTOL'S RECORDING WET and DRY-BULB THERMOMETERS



Humidifying apparatus is useless without some means of checking its operation. Bristol's Wet and Dry-Bulb Thermometers operate on the principle that evaporation varies with the amount of moisture in the atmosphere. They are simple in construction, accurate and sensitive in operation. They insure close control of your humidity conditions at all times. They can be calibrated for all ranges between freezing and the boiling point. Our Bulletin 311-B gives a complete descriptive story.

THE BRISTOL COMPANY—WATERBURY, CONN.

The most extensive line of Recording Instruments in the world

cluded nothing more than is necessary, and then try to get an amount sufficient to put it through. If the required appropriation is too large, estimate those items that can most readily be spared until the expenditure is brought within bounds. My advice to those merchants who have not done work of this kind, is to start in a small way, being sure to do well whatever advertising you do. You will find that it pays to sacrifice quantity for the sake of quality. Results are bound to come; you will quickly sell yourself and your organization on the advertising idea and the size of the appropriation will very quickly grow in proportion to these results.

The next question is, "Who shall do this advertising?" There seems to be an attraction—something that almost amounts to romance—about advertising work when viwed from a distance, and doubtless you will find lots of candidates right in your own organization who think that they can grasp the tiller and steer your ship through seas that have yet to be charted. More often than not, the advertising will be assumed by an executive of the company, and there are instances where this has worked out very well. Usually, however, other executive duties interfere and before long whatever advertising plans existed, have been pigeonholed or shelved and forgotten.

There are many reasons why your advertising should be entrusted to some one whose whole principal duty will be to see that the plans are carried out to the letter. Experience in this work is important, and if placed in charge of a man who understands his job, it will be possible to effect many savings and probably secure superior results. Even though you are planning a comparatively small expenditure, you will find in the suggestions that I will make that there will be plenty in this job to keep such a man busy.

If you finally secure the right one who can analyze your problems and put into printed words all of those things that you want your customers and prospects to know about—he is going to be your most profitable salesman. To his lot will fall the major share of the planning and when this is completed, scheduled and approved, and his appropriation decided upon, he must get his campaign across to the salesmen. Their close cooperation is most necessary. Then comes the mailing list, the consideration of trade journals, the preparation of copy, layout, engravings, printing, envelopes, and the innumerable other details that must be looked after.

Problems of the Advertising Man

The problem he faces—or that any paper merchant faces, for that matter—is no harder than that of anyone else who distributes a product to be converted. Most of us are inclined to believe that our particular proposition is different and more complicated, but I hold that if all our advertising problems were undressed—if they were stripped of all the foodle-doodle that we like to drape about them—they would look pretty much alike. It would be mighty hard to prescribe a dose for one that would not ease the other fellow's pain.

To demonstrate this, I have attempted to analyze and prescribe for an imaginary distributing business in a rudimentary way, and I think that as I proceed you will each agree that problems of our imaginary friends and your own are very similar, and consequently the solution of one will apply to the other. Let us assume that this particular business has watched with a great deal of interest the success of houses who have advertised in other lines—has even heard of paper merchants who have increased sales and built prestige by this means. A tentative appropriation has been made and the services of an advertising man have been secured. Our new man, who immediately is given the impressive title of Advertising Manager, listens respectfully while each member of the organization tells him in a few terse words how to handle the situation. And then he makes his detailed analysis.

We shall pass by the first few points regarding the details of the business, the field, and so forth, until we come to the first real contact with the advertising problem:

What is our aim? Our aim is to make more money through greater sales and to procure and hold the respect of the trade through better service and keener cooperation.

How can this be accomplished? By carrying the story of our goods. service and cooperation convincingly to the printers (which term includes also the publishers, lithographers, engravers, stationers, etc.), and to the printer's customer—the consumer.

Whom must we reach? To answer this correctly with regard to the printers we should include the management, the buyer and the printer's salesmen. In the larger shops, the superintendent and the head pressman. In agencies, the production men and artists,—particularly the latter when representing cover stocks. Photo engravers are in a position to do your papers a world of good by proving on your stock; cultivate them. With the consumer, the first man is the advertising manager, then the management, and sometimes the purchasing agent if printing orders pass through his hands. Even students likely to get into the printing or advertising business are worthy of attention.

What to Tell These People

What shall we tell these people?

1. We must make these prospects acquainted with our goods by sampling.
2. Let them know what our papers will do for them by submitting specimens or testimonials of what they have done for others.
3. Build up a friendly atmosphere that will smooth the way for our representatives by a house magazine.
4. Create a desire for our goods through the story of quality and service.
5. Secure the cooperation of the printer's salesman by giving him helpful suggestions, dummies, etc., to the end that he will sell the job on our papers.
6. Develop a greater market for printed matter and incidentally printers' papers by carrying the story by direct mail advertising and its advantages to the consumer through promotional advertising or solicitation.

What means have we? Magazines, trade journals, newspapers, mailing pieces, personal letters and promotion men. There are so few of us whose distribution is sufficiently wide to make the national magazine a profitable investment, that we shall eliminate it from our consideration.

The Trade Journals

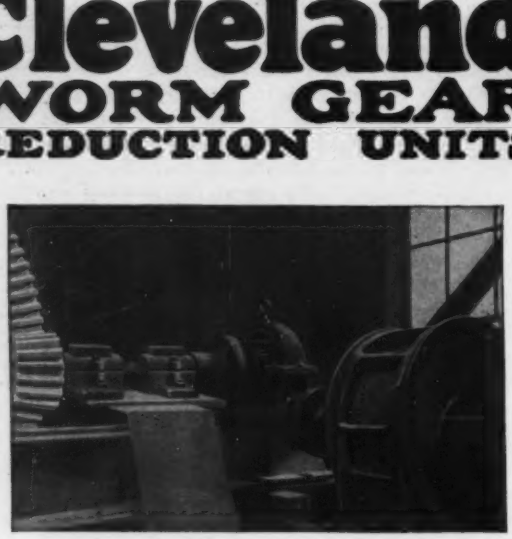
The trade journals, correctly used, are mighty able assistants to personal solicitation, direct advertising, and are second only in importance to the mailing of samples and specimens. With the right kind of copy the journal pages are very valuable because the printer reads them, passes them around the office, and at times they get out into the shop. The advertiser, who appears regularly soon cultivates more than a speaking acquaintance with his readers, and when his name or product is brought before the printer in a specification, he is regarded rather as a friend than as a stranger.

The newspaper is the means of getting to the man behind the gun. Very often there is some one in an organization who controls the advertising appropriation and consumer purchases. Likewise, very often, he is a man whom you do not know, and consequently cannot influence in any other way. Through the newspapers it is possible to get into this fellow and with various kinds of advertising you will create not only a realization of the need for the things into which your product goes, but a familiarity with your product that will cause him to know it as something other than just paper.

Mailing Pieces

Mailing pieces—direct by mail advertising—I have found to be by far the most effective means to reach both the printer and con-

Cleveland WORM GEAR REDUCTION UNITS



Cleveland Worm Gear Reduction Unit applied to revolving screen. Motor 25 hp. at 860 r.p.m. Ratio in worm drive 7½ to 1

The Modern Shop

Features Freedom from Noise

Did you ever listen to the noise of a common reduction gear?

The older it gets the worse it gets.

Modern shop practice calls for freedom from unnecessary noises.

This suggests Cleveland Worm Gear Speed Reduction Units.

A hardened, ground and polished steel worm and a bronze gear running in a cushioning bath of oil—and all completely enclosed—no wonder it is the quietest gearing in the world.

If you don't know about it investigate. We will gladly submit complete information. Write

The Cleveland Worm & Gear Co.

America's Worm Gear Specialists

CLEVELAND, OHIO

Weighs One Sheet and Computes Weight of Ream

The Toledo automatic paper ream scale regulates the run at the mill; checks up variations in stock for the wholesaler, and gives the printer correct basis for estimates. Other automatic Toledos for other processes, from pulp to paper. Ask for particulars.

Toledo Scale Company, Toledo, Ohio

Canadian Toledo Scale Co., Limited, Windsor, Ontario

Largest Automatic Scale Manufacturers in the World
106 Sales Rooms and Service Stations in cities in the United States and Canada. Others in thirty-four foreign countries.

A High Grade Paper Scale

As a Basis Weight Scale it reads to tenths of a pound.

As a Moisture Content Scale it reads tenths of a gram or thousandths of a pound.

The Dial is 22 inches long with large white on black divisions.

The bearings are jewelled and readings are practically instantaneous.

All parts are interchangeable. Ask for particulars.

THWING INSTRUMENT COMPANY

3353 Lancaster Avenue PHILADELPHIA, U. S. A.

127

sumer. We approach our man directly, and place in his hands a sample, tell our story and offer testimonials of the printing qualities and general appearance of the printed stock. Remember that the average salesman calling on the printer has only time to cultivate friendship and take care of the day's requirements. Your mailing pieces must convey ideas that can be profitably used by the printer in his own business, or in the interests of his customer, and at the same time they should lay as much stress as possible upon the service that the paper merchant can render.

In considering the mailing piece, we find our problem somewhat divided, due to the fact that some houses are mill brand houses; others private brand houses, while still others are a combination of the two. From the standpoint of advertising material, the man who is handling mill brands has a certain advantage in that the mills are constantly furnishing him with a great deal of material that he can use in his mailings. Unfortunately, this material is not always of the best, because many of these mills use up a lot of good and costly space and material telling what their product is, rather than what their product does. A discussion of manufacturing technicalities means a great deal, perhaps, to the manufacturer, but the average printer does not care a darn, and his customer cares not at all. A lot of useful information could nicely be added to the average mill sample book.

Nevertheless, it is a big help at times to have some of this material to fall back on, and to be able to tie up your own work with some mill's national advertising, is very effective. The story of wide distribution can be impressively dressed up and the mailing of proofs of this national advertising does much to create familiarity in the minds of your prospects.

Private Brand Advertising

Private brand advertising can combine institutional advertising with that of a particular paper, and work of this kind, if done right, increases the popularity of the merchant's brand, and establishes something that he owns outright.

Whether mill brand or private brand, however, it is well to keep in mind that every piece of advertising material should be put out with a definite purpose—that it should carry with it an idea of service to the man who receives it. To operate most efficiently for you, the mailing piece should be so designed that the recipient will want to retain it, because it has a value other than a mere effort to sell, or as a sample of paper to which you want to draw his attention.

There is another thing to be taken into consideration in the preparation of this material, and that is, whether or not the mailing piece will be used by the printer or by the consumer. In order to cover this point properly your material should be prepared in two ways. For the printer, an ordinary sample in booklet form or a swatch, and with the sample should go all possible information that can be given. This would include sizes, substances, colors, finishes, etc. In book papers it is important to give bulking information, and likewise, the character of engraving which can best be used on the stock.

For the consumer, and also for the printer, there should be a demonstration piece that will very clearly show what the stock will do. Demonstrations must by all means be kept within the bounds of commercial duplication. By this I mean, that it is poor policy that prompts anyone to distribute a demonstration piece that cannot be duplicated under ordinary pressroom conditions in the average shop; and I suggest that you put no prices on consumer advertising. The piece that goes to the printer can have a small slip inserted to give him this information, and he can remove this slip when showing the book to a consumer.

The Mailing List

The mailing list is the backbone of the campaign, and I cannot say too much of its importance. Unless the list is right, or very nearly right, you at once lay yourself open to a loss of material, postage and time, that can never be made up. When you start to compile a list, begin with the ledger. First take those customers who are doing business with you, and next those people who have done business at one time or another, but for some reason have stopped. If your list is more or less unlimited, you can very readily add to it, from a list that the Typothetæ will gladly supply, the Typo Credit book, Dun's or Bradstreet's, telephone directories, or lists prepared by people who make this their business. As a rule, the extent of the list must necessarily be governed by the amount of money you intend to spend, and let me say again, that it is far better to sacrifice quantity for the sake of quality and continuous mailings.

Firm names are not at all satisfactory, and it is very much better that you address personally the individual whom you wish to reach. To keep your list up to date it must be checked constantly. When you send out your mailing, guarantee return postage if not delivered; and periodically, enclose a post card that states frankly that its purpose is to check the list to make sure that the address is correct and to request assurance that the person in question desires to be kept on the list. These precautions may seem somewhat extreme, but the amount of trouble that you go to in keeping your list alive is unimportant compared with the results you will receive if you watch it closely.

Once the list is made up, it should be nursed very carefully to see that a lot of worthless names do not creep into it. No name should be added to the list unless it has the O. K. of the sales manager, and a careful record should be kept so that at any future date it is possible to tell just who the party is and why the name was put on the list. In fact, a file should be kept of the entire list giving this information, and I might add that this is particularly desirable when the list deals with individual names rather than with firm names.

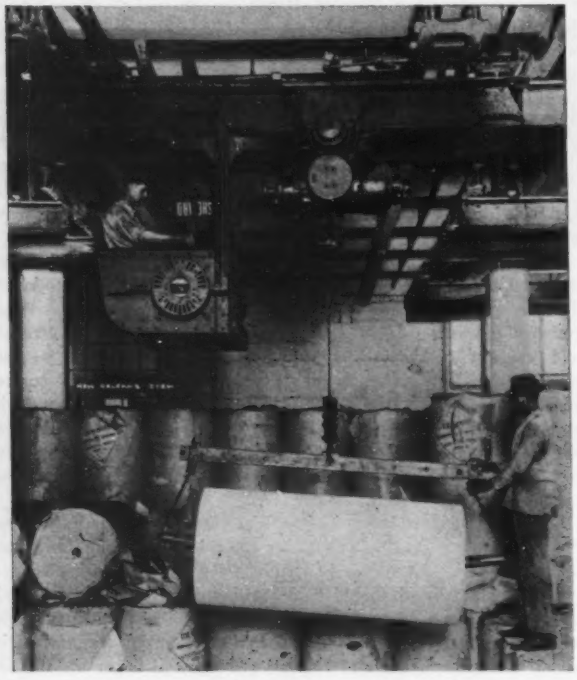
Before leaving the subject of the list, I want to call your attention to the question of envelopes, because until recently it was felt that the envelope was rather unimportant. A great many people believed that all mail was opened by an office boy and laid on the desk of the fellow who is meant to receive it. This practice used to be general, and in some instances still is, but, since mailing lists have come to contain personal names, analysis has shown that more often than not, your mail reaches the man for whom it is intended in its original envelope, and a poor envelope certainly detracts from the effectiveness of the material it encloses. The difference in cost between a good envelope and a poor one is trifling compared with the impression it creates, and I am inclined to believe that it is very bad judgment to attempt an economy by cutting the quality of the container.

Sample Cabinets

Sample cabinets have a very important place in our scheme, and they should be of such size and arranged in such a way that practically all of the direct-by-mail pieces worthy of being retained can be conveniently filed. Many of the better plants, where it has not been an unusual sight to see from eight to twelve cabinets piled up, are getting away from the individual cabinet, preferring to file samples in a regular correspondence file. This situation can very nicely be met by supplying an index to fit these files, and it has been my experience that worthwhile material is carefully saved for future reference.

The cabinet constantly demands attention. If incomplete, it is worse than useless, and it should be one of the principal duties of the salesman calling on the account to watch the cabinet, make a memorandum of missing pieces that can be supplied on his next call, and at all times see that it is kept up to date. Where the organization is large enough and you have the funds at your disposal, you will find that it pays to have a bright young man who does nothing but call where your cabinets are located, keep them in order, see that everything is correctly filed, and look after the replacement of samples that have been taken out and mislaid.

House magazines are excellent good will builders, but to be effective they must be edited with the greatest amount of care and



"Through without change"

That's how the Shepard "Aerial Railway of Industry" works. A roll is picked up at one corner of the bay and and conveyed to any point on the floor. The hoist can be run from Transfer Crane onto any one of a number of Monorail tracks that serve side bays. Every operation of lifting, carrying, and lowering is in the hands of *one man*—the operator who rides in the traveling cage.

Many paper mills have found a long sought economy in the Shepard "Aerial Railway." We have prepared, and will send on request, a copy of our book describing this equipment.

SHEPARD ELECTRIC CRANE & HOIST CO.
378 Schuyler Ave., Montour Falls, N. Y.

Branches in Principal Cities
Member Electric Hoist Manufacturers' Association

2348-S

SHEPARD
ELECTRIC CRANES & HOISTS

FINANCING
for the
Pulp and Paper Industry

¶ Our long experience in industrial financing includes the successful marketing of eighteen issues of the securities of American and Canadian Pulp and Paper companies having net assets of nearly $150,000,000.

¶ If you desire cash for extension, refunding or additional working capital, let us assist you. Our organization, backed by large resources, is equipped for prompt and intelligent service.

Peabody, Houghteling & Co.

Established 1865

10 S. LaSalle St. CHICAGO
366 Madison Ave. NEW YORK

Fabroil Gears

Fabroil Gears, developed by the General Electric Company for use in its own plants, combine silence of operation with the durability of cast iron. Their use multiplies many times the life of the gears with which they mesh.

Ask for Bulletin 48703-B

General Electric Company
General Office Schenectady, N.Y.
Sales Offices in all large cities
40-266

must be planned along lines that are absolutely unselfish. You will probably find this hard to do, but its first function, nevertheless, must be to interest and educate, and when you blow your own horn it must be done very quietly. The man who receives it will appreciate it because of what he gets out of it for himself, not because of what you put in it for yourself.

Personal letters have been found to be one of the best ways to cultivate old customers and make new ones welcome. The secret of success in these letters lies in making them personal, not only in their message, but in their appearance. Such letters are fine for important announcements, especially when addressed to the consumer; and also in this way you can profitably congratulate a customer whose account has noticeably increased. It lets him know that you have your eye on him and appreciate the increased business, and he in turn appreciates the personal attention that you display. Likewise, you can very nicely express to a customer, whose account has fallen off, your regret that you have not received more business for the month or the quarter, and seek information as to whether or not the falling off was due to any lax service on your part, or dissatisfaction with the merchandise.

Promotional Men

Promotional men come next, and while not exactly a new departure, their use is less general than any of the other means I have mentioned. A good promotion man must be a combination advertising man and paper man combined. He must know and understand the subject from both sides of the fence. Have an appreciation of the things the advertising man would like to accomplish, and a thorough knowledge of the possibilities of the papers. His work is principally with the agents, artists and consumers, and my experience indicates that it is decidedly inadvisable to have this man ever quote a price. The further he can be kept away from the appearance of selling, the better, because in this way only can we avoid the very natural idea that the printer might form that we were making an effort to sell the customer direct.

Perhaps I am going too far in including the sales promotional man in this advertising plan, but I have done so because I want to point a way in which the advertising man can profitably use his spare time,—if he has any.

And there I'm going to stop, gentlemen. If it were permissible to trespass further on your time, there is much that could be added to this paper, but I think that I have gone far enough to convey to you some idea of the ground to be covered by the paper merchant. Advertising does pay in the paper business, if carefully planned and executed. Study your field and make each piece perform a definite purpose. Your efforts will lower your cost of selling and many of the difficulties of distribution fade away before a properly directed advertising appeal. But, above all, make a plan—and follow it.

A MEMBER: Mr. President, may I refer just for a moment to Mr. Dolge's most excellent paper, which I wish might be put in print, and ask that some representative from Chicago give us an idea of how they are working out, and what conclusion they have arrived at, if any, on their returned goods problem,—or will that be taken up this afternoon?

MR. RIDGWAY: It might be done better then.

MR. ANDREWS: Gentlemen, the next thing in order is the report of the Cost Accounting Bureau, Mr. Schoenbucher.

Cost Accounting Report

MR. SCHOENBUCHER: Last year's report concerning the merchandising of printing paper clearly pointed to the fact that certain external influences had affected the merchant's cost of doing business. The basic factors which determine the cost of distributing paper were also developed.

The first insight the writer received concerning the real factors which determine the cost of distribution was derived from certain theories and principles evolved by Mr. George Olmstead, a number of years ago, and from a few remarks made from the speaker's platform of Mr. Edward Herrlinger during his term as vice-president of this association, over two years ago.

It is, therefore, interesting to note that leaders in both divisions of the association have contributed toward establishing these principles which are now generally recognized as underlying the cost of distribution in this industry.

The visits made to fine paper merchants during the latter part of 1921, and the early part of 1922, provided the writer with information and experience which were a material aid toward the development of these principles. Contact with merchants in various parts of the country disclosed a surprising lack of knowledge on the part of most merchants concerning these elements which determine cost. About nine merchants in ten regarded turnover as some magical cure for all ills.

With the foregoing conditions in mind, this office started a definite educational program during the annual meeting in April, 1922, and carried it into all markets until about August. Pamphlets were issued; talks were made in the various markets with the aid of charts used in demonstration, and personal visits were paid to the members. The keynote of this entire campaign was based upon the "new" principle that the average size per order of any line was the all-important factor which determined the expenses of its distribution. I believe that this principle is now in a general way recognized by most merchants.

Here and there we hear the statement made that the cost of distribution is too high. Several articles by outsiders have recently appeared in the trade journals raising this point. The contents of these articles are of no great importance and moreover are quite amateurish. The headlines and subject matter, however, may lead to ridiculous and unsound conclusions unless merchants inform themselves regarding the basic facts concerning this important subject.

Between Manufacturers and Printers

Paper merchants operate between manufacturers and printers. Both of the latter take material and by means of machinery, convert it into something different from what it was. Tangible service is thus performed by both. They both have intricate cost problems, and in fact both bear all of the earmarks of manufacturers. An interesting story can be woven into the warp and woof of their plant operations. Upon close analysis, however, it will be agreed that while paper manufacturers are in fact manufacturers, printers are in fact contractors and converters with merely the appearances of manufacturers.

Paper is one of those commodities which is manufactured in great bulk and sold to a considerable extent in exceedingly small quantities. A machine in a certain paper mill will run steadily for 24 hours and produce a given quantity of paper. Let us assume that that paper machine produces in one day 2,700 reams of paper of a given thickness and size. This is made from one production schedule in one run. When the product of this machine reaches the merchant for distribution, what a vastly different picture is seen:

The merchant or distributor is obliged to fill 1,080 orders before he disposes of a single day's output of that machine; he is obliged to make 1,080 billings; 1,080 stock record entries; 1,080 deliveries; 1,080 debit and probably 800 credit bookkeeping entries; handle about 12 cases inward and 1,080 orders outward in the warehouse and, finally, in addition to the handling of full packages, the stockmen must count out in sheets and wrap separately parts of about 400 of these orders. Hazarding a guess, these fractional parts of an order compel the stockmen to count out between 50,000 and 75,000 sheets from every single day's output of that machine. All of this service is performed without converting the nature or appearance of the goods handled. It is this picture which now and then causes some critical spleen venting fool to show manufacturers and printers in the light of necessary factors whereas merchants are merely to be tolerated.

The printer looks like a manufacturer in outward appearance. In the aggregate he may purchase $30,000 or $50,000 (more or

The Glatfelter Mills

AT SPRING GROVE, PA.

With a daily capacity of 90,000 lbs. of Soda Pulp and 200,000 lbs. of Paper is one of the most modern mills in the country, with a product uniformly satisfactory.

ESTABLISHED P. H. GLATFELTER COMPANY SPRING GROVE 1864

SPECIALIZING ON

MACHINE FINISH BOOK PAPER
SUPER CALENDERED BOOK
BULKY BOOK ANTIQUE BOOK
SPRING GROVE BOND AND WRITING
SPRING GROVE MIMEOGRAPH, TABLET AND DRAWING

You are safe if You Specify the Glatfelter Lines.

P. H. GLATFELTER CO.
Paper Manufacturers, Spring Grove, Pa.

RODNEY HUNT

WOOD ROLLS

For the

PAPER INDUSTRY

A Construction for Every Service
A Size for Every Need

Many Standardized Sizes

Tell Us Your Requirements

RODNEY HUNT MACHINE CO.
63 MAPLE ST. ORANGE, MASS.

STANDARD BELT FASTENERS

DO NOT BREAK OR LOOSEN

Samples Sent For Trial

Your belts may be 1" or 50" wide. Standard Fasteners will fasten them quickly and securely.

UPSON WORKS
of the BOURNE-FULLER CO.
Unionville, Conn.
35 Years making Standard Belt Fasteners

Jobbers and Converters

WRITE
PHONE
WIRE
TO

Ajax Paper Mills, Inc.
Tissues—Toilet Rolls
Crepe Napkins

Franklin Coated Paper Co.
Coated Papers

The J. P. Lewis Company
Index—Post Card—Bogus Bristols
Light Weight Board Specialties

Unity Paper Mills, Inc.
Sulphite Ledgers—Bonds

A. R. MELKER

Eastern Sales Representative

110 East 42nd Street New York City
Bowery Savings Bank Building
(opposite GRAND CENTRAL TERMINAL)

Telephone VANDERBILT 6686-6687

less) worth of paper in the course of a year. These purchases are made by placing from 2,000 to 3,000 orders with paper merchants. About ten per cent of these orders may represent around 70 per cent of the total dollars purchased. On these few orders running from cases to carloads the margins taken by merchants run from ordinary wholesale margins common to other industries down to a mere brokerage fee.

On the remaining 90 per cent of the orders placed by printers representing perhaps 30 per cent of the dollars of purchases, merchants find it necessary to take a retail margin on the sales. In plain words, this means that on nine out of every ten occasions when printers and merchants have buying and selling contract, the resulting values arising from such transactions are about on a par with the housewife's "charge and deliver" purchases from her favorite department store. Merchants are obliged to take substantially a retail mark-up on this business in order to at least exchange an old dollar for a new one.

It might be deemed appropriate at this point to really look into how much of the printing consumer's dollar is used to pay for the services rendered by paper merchants.

We have compiled some interesting data showing the disposition of the printing consumer's dollar.

An Illuminating Summary

The following summary should be illuminating to manufacturers, merchants and printers. It is based upon the cost of production of $45,000,000 of printed matter in large and small shops and shows the amount which each factor takes of every $100 of total cost. Printers' profits are not included in the results. Were such profits included, the part of the consumer's dollar taken by paper manufacturers, paper merchants and the miscellaneous material men would be relatively less than stated below by a small amount.

Cost of production before printers' net profits		$100.00
Printers' share:		
Shop expenses	$39.61	
Office, delivery and general expenses	11.54	
Selling and advertising expenses	3.43	
Interest on capital	1.82	
		$56.40
Miscellaneous material men's share:		
Inks, boards, cloth, outside composition, plates, ruling, etc.		11.03
Paper merchant's share:		
Warehousing, handling and delivery	$1.83	
Office and administrative expenses	1.45	
Selling and advertising expenses	1.77	
Net profit and interest on capital	.48	
		$5.53
Paper manufacturer's share:		
Raw materials, manufacturing, office selling, advertising and general expenses, interest on capital and net profits		27.04
		$100.00

A number of actual known jobs were tested and they check very closely with the foregoing general summary.

There is no inference here that manufacturers or printers receive too much of this cost or that merchants receive too little. These figures are stated merely to show how slight is the burden placed on the consumer to pay for the entire cost of the service rendered by paper merchants on the merchant's total business.

Low Cost to Consumer

I know of no industry where the percentage cost of distribution on the consumer's dollar is less. An unfriendly critic aware of statistical anesthetics, might interpose here and say "of course, this may be theoretically true but the reason for this low percentage is not due to high efficiency on the part of merchants. It is caused by the fact that a substantial conversion charge for printing is added to paper after it leaves the merchant's hands and before it reaches the consumer." This objection, while perhaps interesting, does not, however, change the facts one iota.

Must Lower Expenses

If consumers collectively are taxed but $5.53 per $100 for all of the merchants' expenses of distribution and net profit (actually about $5, taking printers' profits into consideration) then efforts made to increase the merchant's efficiency in order to save as much as 25 per cent of the present cost of distribution could not have any appreciable effect in increasing the use of printing, and ergo, paper. Merchants should, in fact must, find ways of lowering expenses, but such reductions will first have effect only on their net profits, since the actual merchandising net profits (eliminating market gains and losses) have been anything but satisfactory for many years.

A prominent manufacturer stated recently that paper merchants are entitled, and should aim, to earn 5 per cent net profit on their total sales. This seems reasonable enough and yet there has been no consecutive three-year period in the last decade or more during which 75 per cent of the paper merchants in business have earned much more than half this percentage from merchandising paper.

Sidelights for Study

The foregoing summary shows a few additionally interesting sidelights for fertile study. The selling and advertising expenses in the cost to the consumer is for printers $3.43 and for merchants $1.77, making a total of $5.20. This expense includes sales management expenses, salesmen's salaries, commissions, advertising, samples, sample cabinets, sales service, salesmen's traveling and incidental expenses. If we arbitrarily assume that these expenses in the manufacturers' totals are 2 per centum of their share of the cost to consumers, namely $27.04 per $100 of the cost, this would amount to an additional $.54 per $100. Thus it may safely be said that in every $100 of cost to consumers of printing, the aggregate selling expenses, both direct and indirect, and advertising expenses of paper manufacturers, paper merchants and printers (miscellaneous material men are omitted) are but $5.74,—really about $5 if printers' profits were added to the summary stated above.

It would be interesting to find out if many other industries could show as low a figure as this.

GENERAL MEETING OF THE PAPER TRADE ASSOCIATION

The general meeting of the National Paper Trade Association was held in the Astor Gallery of the Waldorf-Astoria at 2 o'clock Wednesday afternoon, April 11, William F. McQuillen presiding:

MR. RIDGWAY: Gentlemen, will the meeting come to order. In the absence of our president, Mr. Bicknell, it has been suggested that it would be a nice courtesy if we ask the president of longest standing, here present, to preside at this meeting. Mr. O. A. Miller does not happen to be here, and Mr. McQuillen seems to be the senior ex-president. If Mr. McQuillen is in the room I think he might take the chair. (Applause.)

MR. MCQUILLEN: Gentlemen, this is an honor, but that was not put to a vote. I move that those who desire that I sit here this afternoon, say "Aye," contrary "No." I would not expect any opposition from my home town.

Gentlemen, this is certainly a signal honor for me. The last time I had the pleasure of presiding over this august body was in 1909, being the third president of this association. I can only ask you to bear with me this afternoon, if you find the services I give you rather antiquated.

The first business this afternoon—and I presume we have got to make this real snappy, and if anybody has anything to say, they will speak their minds right quickly and allow us to get on with

J. ANDERSEN & CO.

21 EAST 40th STREET, NEW YORK CITY

Importers of Chemical Pulps

BLEACHED and UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden.
Kronstädter Papieratoff — Fabriks Actien — Gesellschaft
Mills at Tuciansky, Sv. Martin

ESTABLISHED 1882 INCORPORATED 1921

IMPORT EXPORT
RAGS NEW CUTTINGS
JUTE STOCK
ROPE

KATZENSTEIN & KEENE

(INCORPORATED)

63 PARK ROW, NEW YORK

Made for maximum service not merely the average

TRADE JENKINS MARK

Jenkins Bros

Strength throughout

This valve in all its parts is strong enough to meet the severest service in the use for which it is recommended. In addition to its well made body and bonnet consider these features that make for permanent valve service:

The Jenkins Renewable Disc which always forms a perfect contact on the seat and takes up the wear of opening and closing. Discs of various compounds for specific service. Manganese bronze spindle, with accurate, powerful threads.

Stuffing box in bonnet packed with asbestos ring packing, which is compressed by brass gland or follower. Malleable iron non-heat hand wheel, lacquered green.

Carefully threaded pipe ends.

The long service of genuine Jenkins Valves means true economy.

Sectional view Fig. 106, Jenkins Standard Bronze Globe Valve.

JENKINS BROS.

New York Boston Philadelphia Chicago
Montreal London

Always marked with the "Diamond"

Jenkins Valves

SINCE 1864

Whalen Sulphite Pulps

Made from the SITKA SPRUCE of BRITISH COLUMBIA. Noted for Fibre, Color and strength.

SNOWHITE BLEACHED SULPHITE
GLACIER EASY BLEACHING SULPHITE
SWAN STRONG SULPHITE

As exclusive selling agents for the Whalen Pulp & Paper Mills, Ltd., we solicit your inquiries to any of our offices.

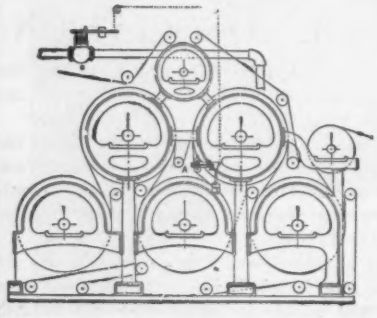
Canadian Robert Dollar Co.

LIMITED

VANCOUVER, B. C.

U. S. ADDRESSES

Robert Dollar Co., Robert Dollar Bldg., San Francisco
Robert Dollar Co., 15 Moore Street, New York, N. Y.
Robert Dollar Co., Harris Trust Bldg., Chicago, Ill.
Robert Dollar Co., L. C. Smith Bldg., Seattle, Wash.



WE ARE SAFE IN OUR PROPOSITION

YOU'LL MAKE NO MISTAKE IN ACCEPTING IT

Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES, BUCKLAND, CONN.

the other business uncompleted this morning. The first business is the report of the secretary.

Report of the Secretary

MR. RIDGWAY: It seems entirely fitting at the very opening of this report to give expression to a sense of thankfulness for the changes which have taken place since we last met in annual convention. When we gathered in this room a year ago, the industry had shortly before closed one of the most disastrous years it had ever experienced. At that time there had been little, if any, improvement in the demand for paper and red figures were still prevalent on the balance sheet. Present conditions, while not yet entirely satisfactory, are by contrast so improved as to justify hearty thanksgiving.

During the year, in fact since the beginning of this calendar year, two men have passed into the great beyond, who as officers of this association so administered their duties and directed its activities as to warrant the statement that had it not been for them, this association would not have attained its present measure of success.

E. U. Kimbark, the fourth president of the association, from 1910 to 1912, had in large measure those qualities which make for success. Those of you who were present at the meeting over which he presided will have no difficulty in recalling the many evidences he gave of the thoroughness of his study of the problems of the association and of the paper merchant; of the logic of his reasoning and of the wisdom of his recommendations. His convictions were so sincere as to inspire united support and above all else, he both merited and commanded the unreserved respect of every one in the industry. His death on February 25 last took from this association an outstanding member, whose memory will long remain with us and whose place cannot be completely filled.

Curtis E. Lyter served as assistant secretary in charge of the Wrapping Paper Division from November 1, 1917, to January 1, 1920, when he was compelled to retire from that office to seek the restoration of his health. From that time down to his death on January 27 of this year, his services and advice were available to the association in an advisory capacity. He it was who built the foundation upon which the Wrapping Paper Division has been reared and how well he builded has been demonstrated by the growth of that Division in power and influence. His task was no easy one but its difficulties only added to the enthusiasm with which he overcame them. His optimism in the face of physical suffering was marvelous and his tenacity of purpose and courage all but brought him victory in his long battle for health against overwhelming odds. He had the love and admiration of all and his life and work will ever be an inspiration to those who had known him.

We believe the members generally are thoroughly conversant with the work of the association during the past year. The activities of the Fine and Wrapping Paper Division have been fully covered in the divisional meeting and the reports of the Uniform Cost Accounting and Statistical Departments will give information of their aims and accomplishments. We will, therefore, confine this report to matters not covered by others.

Membership Shows Gains

The individual membership of the constituent associations exclusive of all duplications shows a gain of three for the year and totals 343 as against 340 a year ago. The greatest gain has been made by the New York Association, which added eleven new members since last fall through the excellent work of a special membership committee. We would urge all local associations to undertake membership campaigns with the view of enrolling every desirable paper merchant as a member of the National Association. The chief losses in membership were in the Pacific States and Middle States Associations, which show decreases of 5 and 4, respectively.

We are pleased to report that the Southeastern Association, which had for all practical purposes ceased to function has been superceded by a new association covering the same territory. The new association, to be known as the Southern Paper Trade Association, was the result of the work of the assistant secretary in conjunction with a few of the old members of the Southeastern. The organization meeting was held in Birmingham in February and was attended by Mr. Higgins and Mr. Schoenbucher, representing the National Association. It starts with a membership of seventeen.

During the year, your secretary has visited Philadelphia, Buffalo, Rochester, Erie, Cleveland, Chicago, Boston, Baltimore, Minneapolis and Washington; the assistant secretary and the head of the accounting bureau have both travelled extensively, all in the promotion of association affairs.

Salesmen's Compensation

At the fall meeting in Chicago, it was announced that the association was making a survey of methods of compensating salesmen and would offer a plan which would be fair both to the house and the salesmen. The survey developed the fact that there are many and varied methods now in use throughout the country and that even in markets where a given method was in the preponderance, there were others which differed in principle as well as in essential details. A short time ago, it became apparent that because of the irreconcilable differences in the basic principles of present methods no one method, no matter how perfect in theory, could possibly be accepted by a sufficient number of members to give it a chance of general adoption. Therefore, the better course would seem to be to make a start in some market where present methods are reconcilable and a plan approaching the ideal could be reasonably expected to have acceptance and a fair trial. The association therefore, stands ready to co-operate, upon request, with any local association, or any individual member, desiring to put the compensation of salesmen on a sounder basis.

Federal Trade Commission

Your secretary has kept in touch with the proceeding instituted by the Federal Trade Commission against the Pacific States Paper Trade Association and others, in order that he might be in a position to advise as to the application to the activities of this association of any order to cease and desist, which might be issued. The facts as to the practices complained of have been agreed upon by counsel for the commission and for the respondents, and a proposed order has been drafted and submitted by the commission, but no order has as yet been entered. After a careful study of the stipulation covering the facts, we are confident the National Association will in no way be affected by an order based on such facts. The proposed order, as we read it, would prohibit a presentation to manufacturers, by other than individual action, of the economic reasons why such manufacturers should not sell both the merchant and his customer. The facts as stipulated do not contain any statement of the use of means of this character to keep business going through "legitimate" channels and the commission appears to be exceeding its authority in proposing so broad an order. We are also of the opinion that it is legal for a group of men engaged in any business to combine for the purpose of keeping business in legitimate channels by means which stop short of boycotts, threats of boycott, white or black lists, etc. Consequently, if the order of the commission, as and when entered, should contain the broad and sweeping prohibitions of the proposed order, the trade as a whole should make sure that an appeal is taken to the courts with the view of definitely settling what can or cannot be done to collectively combat illegitimate competition.

Paper Business Good

The paper business is good and has been for some few months. Last fall every one was talking "good business" for the first six

DIC
Circular Dies

ALL SIZES IN STOCK

From 1 to 12 inches, in one-eighth inch fractions.
From 12 to 18 inches, in one-fourth inch fractions.
STOCK LIST UPON REQUEST

INDEPENDENT DIE COMPANY, Inc.
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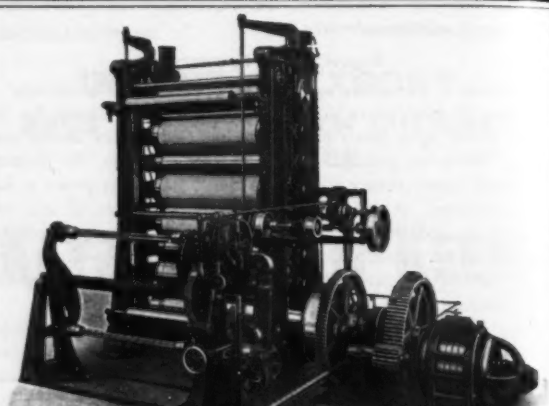

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months of this year, and now the authorities and nearly all individuals can see nothing but a continuation of present conditions for at least the balance of the year.

There would seem to be nothing in sight at the present moment to cause us to quarrel with this rosy view of the future, but we are hopeful that the sad memories of the happenings of 1921 have not been so dimmed in the short space of one year as to make you forgetful of the lessons to be learned from that disastrous experience. The present tendency of all business is toward inflation. This does not mean that there is inflation or that there will be inflation but unless the highest degree of care is exercised by business men, both within and without the paper industry, inflation is quite apt to occur. We believe you are all sufficiently familiar with the after effects of inflation as to cause you to avoid it as you would black cholera. Hence we are not going to take time to present more than a thought or two at this time.

Inventory profits are never permanently realized for inventory losses generally more than offset any gain in the appreciation in the value of inventories. The paper merchant makes a real, tangible, permanent profit only when he parts with the possession of merchandise he owns, or has contracted for, namely, makes a sale at a price which included his cost plus all expense, plus a profit. On both a falling and a rising market, the merchant's selling price must be based on replacement value. In the first case, competitive conditions compel it and in the second ordinary horse sense dictates it. The customary mark-up will return only a reasonable profit on an absolutely stable price and is insufficient to provide for any insurance against the unavoidable inventory loss which accompanies a falling market. The only possible insurance against such a loss is the extra profit, represented by the difference between cost and market when prices are rising. Certainly 1921 proved this beyond the shadow of a doubt.

It is impossible for a merchant to do business without a stock of merchandise and it is entirely probable that prices will be lower than they are today. When the day of lower prices comes, whether in the near or the remote future, the merchant will inevitably suffer a loss. The smaller the quantity of merchandise on hand, the less will be his loss. Therefore, careful buying at all times would appear to be sound policy.

We believe the year will prove reasonably satisfactory both as to the volume of demand and profits and the paper merchant can look forward without fear of a repetition of the disaster which followed the post-war inflation, provided only he practices conservation and does not yield to the temptation to take a chance. The industry took a chance in 1920 and repented in '21.

MR. MCQUILLEN: Gentlemen, you have heard the report, which was a very able one. What is your pleasure? Do I hear a motion to approve?

(The motion to approve was duly made, seconded and unanimously carried).

MR. MCQUILLEN: The next business is the report of the Cost Accounting Department, Mr. Schoenbucher.

Cost Accounting Department

MR. SCHOENBUCHER: Mr. Chairman and gentlemen: My report at this meeting will be very brief. These charts you see here are charts prepared during the last ten days, in connection with the Fine Paper Division. I just mention that to point out that we have data available, both from the merchants' standpoint and from the customers' standpoint, which is so quickly available that we can prepare these charts, covering all of these fundamentals of business in such a short period.

I certainly hope by the time of the next meeting in Chicago that we will have charts of similar interest for the Wrapping Paper Division. I do not know exactly what shape those charts may take, but there is certainly something of interest that we might put on paper. During the last six months, practically all of my time has been spent in the Wrapping Paper Division. During the coming year perhaps some effort will be made to put down on paper suggestions following Mr. Dolge's paper this morning, which might point here and there some way in which perhaps you might effect some little economy. Not that I assume I could tell any of you gentlemen how you might make your business more efficient, but I think it is generally admitted if we can get the suggestions and ideas from a number of houses and present a composite sort of picture, a sort of a questionnaire, so that you might look over this questionnaire and self-examine your own business, that something might be developed from it. I am not promising that this is going to be done or what will come out of it, but I think such a thing is possible, and we are going to try to work it out. Thank you, gentlemen. (Applause.)

MR. MCQUILLEN: Gentlemen, the next pleasure that we have is to be an address on "The Domestic Distribution Department of the Chamber of Commerce of the United States and some national problems in distribution," by Mr. Alvin E. Dodd, the manager of that department.

Mr. Dodd delivered a very interesting address for which he was thanked.

We will now hear from Mr. Pape, the statistician of the National Paper Trade Association.

Statistical Report

MR. PAPE: It is with considerable diffidence that I presume to speak to you for a few minutes this afternoon on the subject of statistics. My only reason for doing so lies in my belief that the subject is one that, particularly at this time, demands your most urgent consideration. I have no recommendations to make but shall be disappointed if you do not draw some conclusion from the examination which I propose to make into, first, the inception, growth, present position and future prospects of the association's statistical activities; second, statistics in general and third, the relation between the statistics of general business, the paper trade, and the paper merchant.

There is one thought which more than any other I want to develop. It is aptly expressed in the sentence which I quote: "If it is not useful, it is not worth while." Are statistics worth while? Applying the rule, we may say that depends upon whether they are useful. It is an acid test, but I fail to see why it should not be applied to the statistics of the association.

We have before us then the question, "Of what use are statistics?" In my opinion the question is one of paramount importance at this time, and that it should be so, is purely a natural stage in the evolution of statistics within the association.

As you are aware, collection of statistics was begun in the first instance at the request of the Fine Paper manufacturers, whose own records, it was felt were incomplete without supplementary records in the field of distribution. Their chief interest lay in a record of the merchant's sales representing consumption, but the association decided to go beyond this and keep records which would reflect the statistical position of the paper trade itself. This decision was largely influenced by the countrywide recognition which was being given to the new science. It was felt that if the steel, coal, sugar, copper and other industries were able to derive benefit from the study of the statistics of their respective industries, that the paper trade ought to be able to do likewise. It was through this idea alone, since no wrapping paper manufacturers' records were available, that the scope of the statistics was enlarged to include wrapping paper.

You were told at the outset that they would have little value for some time to come, since the very essence of statistics is the time element involved. The chief distinction, in fact, between accounting and statistics is that accounting embraces a definite period of time, whereas statistics embrace two or more such periods. That is why they had uncertain value at the time when

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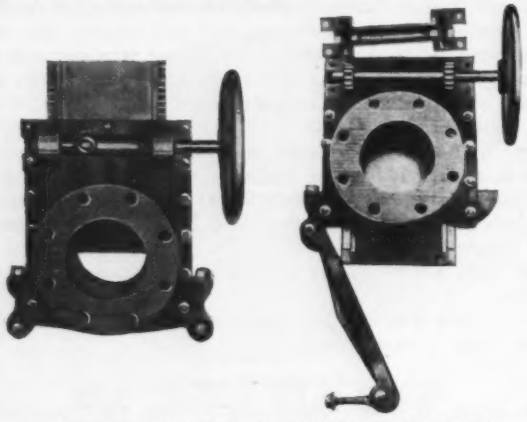

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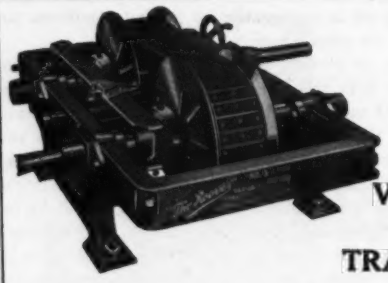

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they were most needed. I refer to the break in 1920. Even at that, it is doubtful if they would have served their purpose, since it is only since then that the full significance of the business cycle, to which I shall refer later, has come to be realized.

Inception of Association Statistics

To the first two reasons cited above, namely, to supplement the manufacturers' records, and second, a sincere desire to keep abreast of any movments that do not progress, may be ascribed the inception of the association statistics. The third reason, namely, that the statistics like wine would improve with age, has played an important part in their continuation.

There has been, however, an undercurrent of feeling or rather doubt, that it was all worth while. I say undercurrent, for on such a subject, men hesitate to come out openly with their questionings. The reason for the situation, as I see it, is that many of you are not using the statistics. To that extent, then, they are not worth while.

Let me illustrate. In response to a memorandum recently sent to all members, I received only one reply expressing disapproval of the association's statistical work. But that member said, "This does not mean that I disapprove of statistics, but only in this particular instance." In other words, he admitted statistics could be used profitably, but did not see where they were being so used in the association.

There is the case in a nutshell. The justification of statistics is to be found in the extent of their use. Lacking use, they lack value. The statistics compiled by the National Association suffer from the fact that some of you are not using them. Others are using them and find it pays. It is particularly for those of you who are not, that the following remarks are addressed:

Measuring Business Activity

First of all, let me call your attention to this chart, a copy of a chart prepared by the American Telephone and Telegaph Company. It is probably the best one of its kind for its purpose, which is to measure business activity from the standpoint of physical volume. The elements together with their respective weights, which entered into the construction of this chart, are as follows:

	Points
Pig Iron production	20
Unfiled orders of U. S. Steel Corporation	10
Freight car demand	10
Car Loadings	5
Net Freight car miles	5
Coal production	5
Cotton consumption	10
Activity wool machinery	10
Paper production	10
Lumber production	5
Leather production	5
Power production	5
Total	100

The method of construction has undergone several changes and it is interesting to find that it was only in April, 1922, when such a change was made, that the statistics of paper production were first included.

Light in the Business Cycle

The value of this and similar charts lies largely in the light which they throw on the business cycle. I presume all you gentlemen know what is meant by the business cycle. It is best defined perhaps as "a constant occurrence of irregularly separated booms and slumps." The cycle consists of four phases, following one another in regular sequence; depression, recovery, prosperity and then crisis and liquidation. Studies made by both the Harvard Bureau on Economic Research and the Statistical Department of the American Telephone & Telegraph Company indicate that since the latter half of the Nineteenth century the average length of the cycle has been about three and one half years. In earlier days it seems to have been about double that length and I presume many of you have heard of the old saying that crises occurred every seven or ten years.

Much remains to be found out about business cycles, first, as to the fundamental causes of the cycle, and second as to why the cycles differ from one another in length, amplitude and regularity, Nevertheless, enough is already known to warrant certain steps seeking to control it and thereby lessen its destructive extremes of peaks and valleys. One example of this is the recent step taken by the government to restrict building during prosperity and encourage it during depressions. Another is the discussion now going on as to how the Federal Reserve system should set its discount rate.

When it comes to studying an individual cycle, we find that there are two barometers which rarely fail to forecast the future. The first of these is credit conditions or the supply of loanable funds. When the supply runs short, a crisis is inevitable and conversely when it is large, recovery is sure to set in. The second barometer is the relation between consumption and production plus stock on hand. When production is running above consumption and stocks are accumulating we know that we are about due to pass from prosperity to the liquidation stage. On the other hand, with consumption running above production and drawing on stocks, the stage is being set for a renewal of business activity.

Gentlemen: It is because we have to gain some comprehension of the business cycle, and because we are able to interpret the movements of such barometers as credit conditions and production in relation to consumption that we keep statistics. Without them we should be working in the dark. Using them as tools we expect to exist some control on the business cycle.

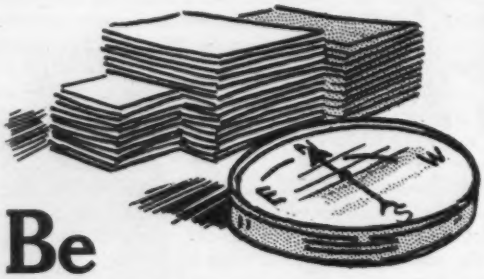
General and Individual Business

It now remains to tie up statistics of general business with those of the paper trade and of the individual merchant. Fortunately, much has already been done along this line and my task is correspondingly easy. It is, however, the line along which considerable effort will be directed in the coming year.

The use of internal statistics by the paper merchant and their relation to the statistics of the trade as a whole was brought to your attention at the 1921 April meeting by Mr. C. E. Moriam. He showed you how the members of the wrapping paper division of the Philadelphia Association increased or decreased inventories to the greatest advantage by the mere expedient of keeping perpetual inventory records and watching their own sales, the sales of the Philadelphia members, and the total sales of the association. To quote from his speech the result was that "it would seem to be an undeniable fact that the stocks of the Philadelphia Coarse Paper Division members were nearer normal on January 1, 1921, than those of the average member in any other section in the country. The Philadelphia distributors, therefore, saved many thousands of dollars of profits earned in 1920." In regard to inventories, I might say that many business concerns using such charts as these or price statistics, have established the arbitrary rule of reducing inventories when conditions are above normal and building them up when conditions are below normal.

Various Uses of Statistics

To give in detail all the various uses to which you can put the association statistics is out of the question. It will perhaps be sufficient to mention a few obvious ones. Suppose your sales remain stationary while total sales increase or that your sales decrease while total sales remain stationary, If this should continue for as much as two months, you are clearly not keeping step with the rest of the trade, and an investigation to determine the trouble should be started. To take a different set of conditions, suppose



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that the average purchases and sales two years were both, say 80 per cent of normal and that last year purchases were 115 per cent of normal while sales were but 105 per cent of normal. Now, if for the first six months of the current year purchases should average 125 per cent and sales 110 per cent of normal, you would be blind indeed if you did not appreciate that a dangerous lack of balance existed, which is sure to result in radical readjustment and for the improvident one, heavy inventory losses. To use statistics for all they are worth is the only way I know of for to foresee with any degree of accuracy the dangerous or the prospects ahead of you.

It should be added, however, that to study the statistical position of paper is not enough. It is too greatly affected by general business for the latter to be ignored. The statistical position of the paper trade may appear strong, but it will not serve to avoid, though it may postpone temporarily, the consequences of a decline in business. On the other hand, even though the statistical position were weak, general prosperity might serve to tide over the expected crisis.

The relationship between the paper trade and general business offers a fertile field for scientific research and when determined, a general knowledge of the relationship, should make for greater stabilization within the trade. In my opinion, this research should not be left to private agencies, but should be part of the work of the statistical department of the association.

The Harvard committee on economic research, it is true, has made some notable progress in this direction, particularly in the weekly letter of September 9th, 1922, which was devoted to the subject of "The Paper Industry and the Business Cycle." Two tendencies were discovered, first, a marked lag of changes in paper prices after corresponding changes in general commodity prices and second, a striking reduction in the length of this lag with passing years. Using statistics of newsprint and newsboard, it was found that between 1903 and 1914, the lag in prices ranged between six months and two years, tending in the latter part of the period to be six months. On the basis of a general index of paper production and paper prices, paper production since 1919 seems to show a lag of between two to four months and paper prices between four and six months.

Gentlemen: I have only presented a small part of the available material bearing on my subject, but I have already taken too much of your time. In closing I just want to leave with you one final thought.

When I first took up my present work, my first impression was that at least a years work was ahead of me before certain changes and improvements that suggested themselves could be effected. Since then, it was noticed in Mr. Naylor's book on Trade Associations, that the average time which it has taken Trade Associations to build up a satisfactory statistical scheme was about five years. Putting two and two together, it looks to me as though the coming year should be a fruitful one, and that with your cooperation we shall have attained by April, 1924, the happy stage to which Mr. Naylor referred.

Death's Heavy Hand

MR. MCQUILLEN: Gentlemen, that strange and wonderful transition, commonly called "Death," has laid a heavy hand on this association during the past year. It has taken from earthly cares and joys to realms beyond two very important and well known members. In February, Eugene Underwood Kimbark, fourth president of this association, answered the call. Brilliant and able, he served you while on earth. The secretary asked me to write a tribute to his memory and, as an outward manifestation of the feelings I know you must have for his memory, I would ask you to arise while the secretary reads it.

(Mr. Ridgway then read the following:)

Eugene Underwood Kimbark, 56 years old, died at his home at Evanston, Ill., on the afternoon of Sunday, February 25, 1923. There had been no indication of any serious impairment of his health, making his sudden passing on all the more painful and acute to his family and friends.

Mr. Kimbark was born in Chicago, March 13, 1867; because of the death of his father he left the high school at the completion of his second year, at the age of 13. After working a few years for a real estate firm he entered the employ o the J. W. Butler Paper Company of Chicago, with whom he remained eleven years, leaving their employ to form, in April 1895, the Paper Mills Company, there being associated with him Mr. P. R. Shumway and Mr. Forest Hopkins.

Mr. Kimbark's activities in civic life were many and varied. In Chicago he served with the Association of Commerce as a director for five years; on the Finance Committee five years; Ways and Means Committee two years; on the Executive Committee two years; Education three years; Military and Naval two years; War Council one year; Daylight Saving two years. He was Treasurer in 1909, President in 1912, and a member of the Senior Council 1913 to 1923; member of Chicago Crime Committee; Committee of 15 and Citizens Committee Landis Award.

During the War he served as director on the Executive Committee of Chicago War Camp Community Service and on the Red Cross and Liberty Bond drives.

He was a director of the Chicago Trust Company and a member of the Union League Club; Art Institute and Chicago Athletic Association of Chicago.

He still found time to look after his civic duties in Evanston, where he lived, and during the war was Treasurer of Evanston War Council; he was a member of the Evanston Club of which he was President four years, and was a member of the Country Club and Glen View Golf Club.

In the paper trade, Mr. Kimbark was for two years President of the Western Paper Merchants Association, and having served from its beginning as member of the Executive Committee, he was elected the fourth President of the National Paper Trade Association of the United States, in February, 1910, serving for two years.

Eugene Underwood Kimbark was extremely versatile, with a tremendous capacity for work, but his greatest attribute was his willingness to give freely of his ability and time for the benefit of his fellow man. Quiet of demeanor, he possessed a persistence, when he felt he was right, that enabled him to accomplish his purpose without engendering ill feeling.

His life was typical of all we like to honor; compelled by circumstances, at an early age, to face the stern problems of this world, he took up his task with earnestness and firmness and fought the battle step by step, ever advancing, avoiding what was bad and adways striving for the good, he won out against all obstacles.

For the example he gave and the work he performed, the National Paper Trade Association wishes to record its appreciation. The paper industry was his chosen vocation and in it, through life, he grew in wisdom, gained in respect and esteem, and in death he has left us a legacy of good work well performed, which will ever be ours in unending memory.

Eugene Underwood Kimbark has passed on, but his name will live with the members of this Association forever.

Tribute to Curtis E. Lyter

MR. MCQUILLEN: The other death was Curtis E. Lyter, whom we all knew and loved. Courageous and able, he made a strong fight for life, but he, too, fell. Mr. Herrlinger has prepared a tribute to him.

I will ask you gentlemen to arise once more.

MR. HERRLINGER: Mr. Chairman and Gentlemen: Mr. McQuillen has just stated that the association has been doubly unfortunate during the past year. It lost our former Assistant Secre-

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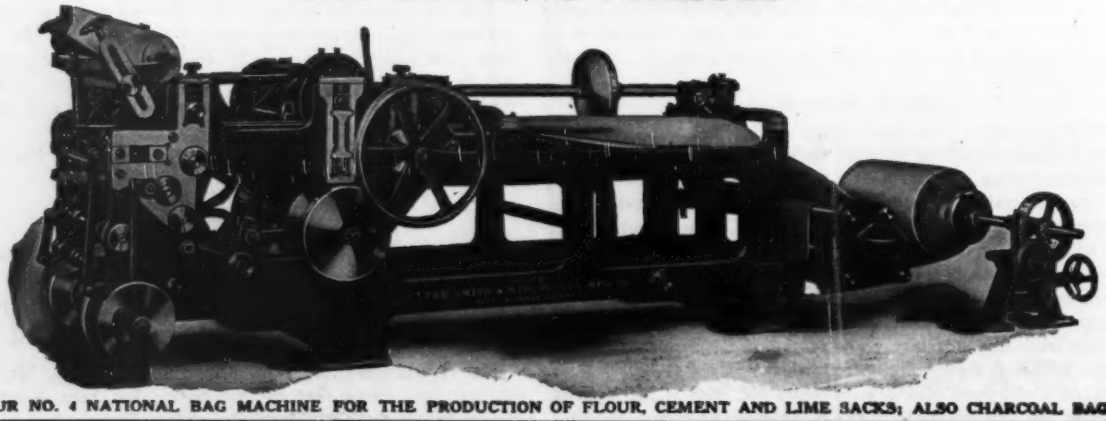

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tary. During his long illness, I have had many unpleasant duties to perform, not because I performed them unwillingly, but because they were so sad. He made a bitter fight, but it was the old story. "God's will be done on earth as it is in Heaven."

It has been requested that I offer a resolution in memoriam for Curtis E. Lyter, who lives peacfully in the little Battle Grove Cemetery at Cynthiana, Kentucky. He had a hard life, and even to the day of his funeral, it rained so hard and the grave was so damp that they were unable to bury him.

I offer the following resolution:

WHEREAS, Curtis E. Lyter departed this life at Albuquerque, New Mexico, on the 27th day of January, 1923; and

WHEREAS, he served this association faithfully and well for many years in the capacity of Assistant Secretary; and

WHEREAS, he was a man of unquestioned honor and integrity, combined with a high endowment of intelligence and capability, as well as a courteous and pleasing personality that deservedly won the confidence of all who knew him, while at the same time he was unceasingly industrious in the performance of his duties, and thoroughly loyal to his friends and colleagues, without in any way sacrificing his own individuality and without in the least degree derogating from his own high ideals of right and justice: Now therefore, be it

RESOLVED, That this association formally spread upon its minutes this resolution in the form of a memorial to Mr. Lyter, as a man whom we loved and esteemed, and for whose passing we have a sincere regret; And be it

FURTHER RESOLVED, That a copy of this resolution be sent to his brothers and other relatives at Louisville, Kentucky.

MR. MCQUILLEN: Gentlemen, you have heard the resolution. Those who are in favor of carrying out the tenor of that resolution signify by saying "Aye."

(The resolution was unanimously carried.)

Board of Directors Report

MR. MCQUILLEN: We now come to the report of the Board of Directors.

MR. RIDGWAY: Except for the nomination of officers for the ensuing year, the Board of Directors has no particular report. The Board of Directors took action on Monday relative to the adoption of a code of ethics which had been submitted by a committee consisting of Messrs. B. W. Wilson, Frank Floyd, Mr. O. A. Miller and Mr. Alling, Mr. Floyd and Mr. Wilson being the only ones present. However, since that action taken by the Board of Directors, the committee itself feels that the form of the code can be improved, and that this association should not adopt any code of ethics which was not 100 per cent perfect in regard to the dress in which it might be clothed. They are, therefore—the committee is about to offer a motion that this code of ethics be referred back to the committee, that the commitee be enlarged, and that the committee report at the October meeting in Chicago. They feel that they have the entire approval of the Board of Directors in that action, although it has not been possible to get the Board together to modify the action which it took on Monday. Mr. Wilson:

MR. WILSON: Mr. President and Gentlemen: When this duty was assigned us, we thought we had carried out the accomplishment that we were desirous to have, but since more careful reading of this code we have prepared, we really feel that it could be improved upon and, therefore, we will ask the membership present that this committee be continued and possibly enlarged by an addition of at least five members, so that we can get a more proper angle on this situation. It is certainly the desire of this committee, gentlemen, to present to the National Paper Trade Association a code of ethics that will be 100 per cent perfect.

MR. MCQUILLEN: Gentlemen, you hear the suggestion from the committee. The committee has done very wonderful work and has really produced something. While it might be satisfactory, they feel it can be improved on and they ask that further time be given and that the committee be enlarged by the addition of five members.

(The motion was duly seconded and unanimously carried.)

Nomination of Officers

MR. RIDGWAY: The Board of Directors would also like to present the following nominations for officers for the ensuing year:

President, Frank W. Power, of Carter, Rice & Co., Boston.

Vice-president, in charge of the Fine Paper Division, Fritz Lindenmeyr, of Henry Lindenmeyr & Sons, New York.

Vice-president, in charge of Wrapping Paper Division, J. A. Carpenter, of the Kansas City Paper House.

Treasurer, A. J. Corning, of the Hobbs-Corning Company of Baltimore.

(These officers were elected.)

Remarks by Mr. Power

MR. POWER: Gentlemen, I fail to find words adequate to express to you my appreciation of this high honor. I wish to say, however, that I shall always treasure the true friendships that I have made during my activities with the association work, and I assure you that I shall always endeavor to maintain the high standard set by my predecessors. A year ago the retiring president said something about a bad egg. A bad egg has proved to be a golden egg. I move you a rising vote of thanks and appreciation of the efficient service rendered by Mr. Bicknell during his term of office.

(The members gave a rising vote of thanks.)

MR. MCQUILLEN: I would like to add a word about our new president. It gives me great joy to add it. He and I are fellow-townsmen. We belong to the same lodge of Masons, and I assure you you have got a good man, well known. I could not let this go by without saying a few tender words in memory to the vice-president who has not been here at all during this session, yet we have complimented him by giving him a re-election. Any man who will pay the price to go to Europe and spend two weeks in preference to this Annual Meeting, ought to be reprimanded, but as he cannot go next year, perhaps we will forgive him this time.

Mr. J. A. Carpenter?

Remarks by Mr. Carpenter

MR. CARPENTER: All I have to say is that I will try and give the department my best attention, and I thank you very much for the honor. I will give it the best attention I can, and see if we cannot produce at least the results that have been going on—perhaps better. (Applause.)

MR. MCQUILLEN: We would like to hear from our efficient and thoroughly honest treasurer, Mr. Corning.

MR. CORNING: Mr. Chairman, there is very little you should hear from me, except that I am elected again. It will be my pleasure and honor to serve the association for another year, and I thank you for your kindness. (Applause.)

MR. MCQUILLEN: I was going to suggest after he read his report, that it would probably be another twenty years before I got another chance to handle this gavel, but that it would seem wise once in a while for the association to have a balance sheet to show its assets and liabilities. We must have several thousand dollars' worth of furniture and printed matter, and we would like to know who owes us and who don't owe us, and the little insides that come into a balance sheet—you all ought to know, and I suggest that the treasurer be good enough, without any further remuneration, to draw that up.

MR. RIDGWAY: I move that it be referred to the Cost Accounting Department.

MR. MCQUILLEN: You are out of order. Is there any unfinished business, gentlemen?

Now, here is where the Kickers' Club opens. Any fault to find with the men who worked for you this year? If there is no further business, gentlemen, a motion to adjourn sine die will be in order.

(The meeting then adjourned sine die.)

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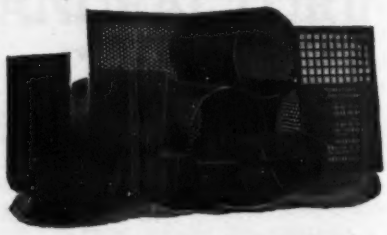

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M. P. Allen, Detroit Sulphite Pulp and Paper Co., Detroit, Mich.
G. R. Alden, Dennison Manufacturing Co., New York.
C. D. Ash, Crescent Paper Machine Co., Phoenix, N. Y.
Lewis C. Anderson, W. G. Oglesby Paper Co., Middletown, Ohio.
W. H. Artz, Westinghouse Electric Manufacturing Co., East Pittsburgh, Pa.
A. L. Allen, General Electric Co., Pittsfield, Mass.
G. G. Abernathy, International Paper Co., New York City.
F. W. Atkin, International Burr Corp., Pennsylvania Hotel.
G. R. Atkinson, Scott Paper Co., Belmont Hotel.
L. M. Alexander, Nekoosa-Edwards Paper Co., Waldorf.
C. K. Andrews, Itasca Paper Co., Ambassador.
A. E. Armstrong, Armstrong Machine Works, Commodore.
A. C. M. Azov, Titan Fuel Co., New York City.

B

Chas. Beebe, Union Talc Co., 132 Nassau street, New York City.
A. Bieque, Canadian Paper Co., Windsor Mills, P. Q.
Edward S. Bryant, Harvard Club, New York City.
N. J. Bowker, Pettibone-Cattaract Paper Co., Niagara Falls, N. Y.
F. T. Burkhardt, Parsons Paper Co., Holyoke, Mass.
R. C. Brown, Kimberly-Clark Co., Neenah, Wis.
J. E. Bellinger, DeGrasse Paper Co., Pyrites, N. Y.
Edward Beck, Canadian Pulp and Paper Association, Montreal, P. Q.
H. B. Barden, Diana Paper Co.
L. H. Buckley, U. S. Envelope Co., Worcester Mass.
Hubb Bell, United States Testing Co., New York City.
Robert Best, Western Paper Maker Chemical Co., New York.
George L. Bidwell, Warren Manufacturing Co., Riegelsville, N. J.
L. M. Booth, Booth Chemical Co., Elizabeth, N. J.
Charles W. Boyce, U. S. Forest Service.
H. H. Brown, Hollingsworth & Vose Co.
D. K. Brown, Neenah Paper Co., Neenah, Wis.
Ray O. Brundage, Kalamazoo Vegetable Parchment Co.
S. F. Boyd, St. Regis Paper Co.
W. F. E. Bragg, Orono Pulp and Paper Co., Bangor, Me.
C. A. Bullard, Marinette & Menominee Paper Co.
William F. Brunner, Patterson Parchment Paper Co., Passaic, N. J.
W. E. Baker, Yorkhaven Paper Co., Philadelphia.
Arthur M. Burr, Prince George Hotel, New York.
W. F. Bromley, Hammermill Paper Co.
H. J. Buncke, Abitibi Co., Iroquois Falls, Ont.
A. L. Bull, Fitchburg Paper Co.
F. L. Barstow, Falulah Paper Co.
L. F. Barsalous, Union Bag and Paper Corp.
F. K. Becker, Bird Machine Co.
G. W. Boyce, Boyce Paper Exchange, Syracuse.
R. D. Bertschy, Miamisburg Paper Co., Miamisburg, O.
E. H. Bush, Crane & Co., Dalton, Mass.
O. F. Bryant, Laurentide Co.
Earle H. Benson, Riegel Paper Co., Pulaski, N. Y.
Gordon Blanchard, Crocker-McElwain Co., Holyoke, Mass.
F. J. Bayless, Bayless Manufacturing Co., Austin, Pa.
J. Victor Barron, Sherman Paper Co., Watertown, N. Y.
H. F. Badgley, Kimberly Clark Co., Neenah, Wis.
W. M. Bovard, Package, Paper and Supply Corp., Springfield, Mass.
D. Branch, Canadian Bark and Drum Co., Toronto, P. Q.
W. J. Barnes, Warren Manufacturing Co., New York City.
Lewis Bloch, Crown Willamette Co., San Francisco, Cal.
H. J. Belyea, New York State College of Forestry.
Aaron Bagg, Parsons Paper and Pulp Co.
J. L. Bagg, Millers Falls Paper Co.
E. A. Bergholtz, American Telephone & Telegraph Co., New York City.
Robert Best, Western Paper Makers' Chemical Co., Commodore.
C. L. Berger, G. D. Jenssen Co., New York City.
H. J. Buncke, Abitibi Co., Commodore.
Henry Burgee, Neenah Paper Co., Vanderbilt.
J. G. Bullard, Huron Milling Co., Prince George.
C. A. Buskirk, Wolverine Paper Co., Commodore.
Charles B. Bacon, Write, Inc., New York City.
R. K. Baker, District of Columbia Paper Manufacturing Co., Waldorf.
C. W. Baker, Bedford Pulp & Paper Co., Pennsylvania.
G. D. Bearce, News Print Service Bureau, New York City.
Clarence Beebe, Neumeyer & Diamond, New York City.
R. L. Bosworth, Crocker-McElwain Co., McAlpin.
S. C. Brayton, Consolidated Water Power & Paper Co., Pennsylvania.
C. A. Brown, Great Western Paper Co., Commodore.
J. M. Bergstrom, Bergstrom Paper Co., Chatham.
Joseph A. Borden, American Writing Paper Co., Waldorf.

C

H. L. Churchill, Finch, Pruyn & Co., Glens Falls, N. Y.
D. D. Coffin, C. H. Dexter & Sons, Brooklyn.
H. B. Collins, Dill & Collins Co., Philadelphia, Pa.
H. J. Craig, S. D. Warren Co., Bingham, Me.
Chapin, Millers Falls Paper Co., Millers Falls, Mass.
E. A. Charlton, DeGrasse Paper Co., Pyrites Co.
H. H. Chase, Brown Co., Berlin, N. H.
C. H. Crowell, C. H. Crowell Co., Brooklyn.
G. G. Chauncey, Three Rivers Paper Co
P. T. Coolidge, Bangor, Me.
P. W. Codwise, Beaver Products Co., Buffalo, N. Y.
R. H. Colley, Forest Products Laboratory, Madison, Wis.
Lewis T. Condon, Continental Paper and Bag Mills, New York City.
O. T. Chalon, Kudruff Paper Company, Kutroff-Pickhardt & Co., Inc.
L. L. Claflin, Erving Paper Mills, Erving, Mass.
M. Cline, International Paper Co., New York City.
A. M. Cadigan, A. M. Cadigan Co., 202 West 74th street, New York.
Harvey Cannon, Jr., New York State College of Forestry.
H. L. Cheney, Srere Pulp and Paper Co., Middletown, O.
J. H. Coy, Flambeau Paper Co., Park Falls, Wis.
F. E. Cuddebach, General Electric Co., Syracuse, N. Y.
Harry Cooper, Cooper & Cooper, New York City.
George E. Crafts, Orono Pulp and Paper Co., Bangor, Me.
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John Cornell, Paper Mill, New York City.
F. C. Clark, Pejepscott Paper Co., Brunswick, Me.
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A. S. Cosler, Texas Gulf Sulphur Co., Chicago, Ill.
G. N. Collins, Dillon Collins Co., Philadelphia, Pa.
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John J. Case, Baker Manufacturing Co., McAlpin.
H. A. Casey, Chemical Paper Co., Commodore.
E. C. Chadwick, L. L. Brown Paper Co., New York City.
Charles Champion, Paper Makers Chemical Co., New York City.
S. H. Childs, Scovell-Wellington Co., New York City.
Ross Campbell, Procter & Gamble Co., Biltmore.
Holley R. Cantine, Martin Cantine Co., Yale Club.
H. P. Carruth, Mead Pulp & Paper Co., Vanderbilt.
O. T. Chelon, Kudroff Paper Co. and Kuttroff, Pickhardt & Co., New York City.
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O. T. Cochrane, Bayless Manufacturing Corp., New York City.
L. H. Cole, Department of Mines, Ottawa—Commodore.
C. H. Cooley, Taylor-Logan Co.—Commodore.
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D

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George Donahue, Hampden Glazed Paper and Card Co., Holyoke, Mass.
H. K. Davies, Pennsylvania Salt Manufacturing Co., Brooklyn, N. Y.
John R. Diggs, Albemarle Paper Manufacturing Co., Richmond, Va.
A. H. DeWess, Waite Wild Asbestos Co., New York.
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A. B. Daniels, L. L. Brown Paper Co., Adams, Mass.
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R. B. Donnelly, Central West Paper Co.—Commodore.
J. J. C. Downey, National Paper Products Co.—Commodore.
A. C. Duncan, Western Paper Makers Chemical Co.—Commodore.
Theodore W. Dunn—Prince George Hotel.

E

W. J. Eisner, Newark Parchment Paper Co., New York.
E. B. Eddy, National Paper Products Co.
George Eastwood, Parsons Paper Co., Holyoke, Mass.
Irvin N. Esleeck, Esleeck Manufacturing Co., Turner Falls, Mass.
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Epply, Hammermill Paper Co., Erie, Pa.
Vance P. Edwards, Interlake Pulp & Paper Co.—McAlpin.
T. W. Esterbrook, Brown Co.—Belmont.

F

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Arthur Freeman, Fort Howard Paper Co.
V. E. Fishburn, Groveton Paper Co., Groveton, N. H.
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Paul S. Fiske, Parker Young Co., Boston, Mass.
L. R. Fritz, Paper Industry, Chicago.
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John L. Forsythe, International Paper Co., Chicago.
Harry A. Fletcher, Fletcher Paper Co., Alpena, Mich.
R. R. Fenska, N. Y. State College of Forestry, Syracuse, N. Y.
M. H. Frank, Armstrong Machine Works.
J. L. Fearing, International Paper Co., Chicago.
F. C. Farnsworth, Farnsworth Co.—Waldorf.
J. F. Finch, Western Electric Co., New York City.
Herbert H. Fish, Jr., Great Western Paper Co.—Commodore.
James Foxgrover, Western Paper Makers Chemical Co.—Commodore.
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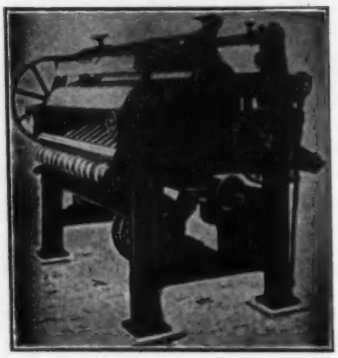

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P. K. Hotchkiss, Hooker Electrochemical Co., New York City.
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J. D. Jenssen, G. D. Jenssen Co., New York City.
Arthur L. Jones, Holyoke Card and Paper Co.
A. R. Jackson, Nekoosa-Edwards Paper Co.—Belmont.
H. H. K. Jensenius, Nilsen-Lyon Co., New York City.
B. Johnson, Hammermill Paper Co.—Vanderbilt.
William D. Judd, Hempshear Paper Co.—Waldorf.

K

F. P. Klund, Hammermill Paper Co., Erie, Pa.
B. L. Kassing, New York State College of Forestry,
Charles J. Kittridge, Crane & Co.
S. C. Knode, Albemarle Paper Manufacturing Co., New York City.
M. A. Krimmel, Hammermill Paper Co., Erie, Pa.
Robert Karlberg, Holmes, Bruks & Fabriks Akt., Norrkoing, Sweden.
R. S. Kellogg, News Print Service Bureau, New York City.
Paul Koenig, Continental Paper and Bag Mills, New York City.
W. A. Kelly, Northern Paper Mills, Green Bay, Wis.
H. L. Kutter, Black-Clawson Co.
C. Kent, St. Croix Paper Co.
Otto Kress, Thilmany Pulp and Paper Co., Kaukauna, Wis.
E. W. Kiefer, Port Huron Sulphite and Paper Co., Port Huron, Mich.
Phillips W. Kimball, Liberty Paper Co., New York.
Charles Kinnerman, Falulah Paper Co., Montclair, N. J.
Alfred J. Kirsh, Bedford Pulp and Paper Co.
Herbert S. Kimball, Boston, Mass.
C. H. Kent, Papermakers Chemical Co., Holyoke, Mass.
C. E. Kinne, Hercules Powder Co., Wilmington, Del.
Thomas J. Keenan, New York City.
A. J. Kennedy, Sandy Hill Iron & Brass Works—Belmont.
Helen U. Kiely, American Writing Paper Co.—Commodore.
K. T. King, E. I. Du Pont Nemours—Vanderbilt.
J. Kindleberger, Kalamazoo Vegetable Parchment Co.—McAlpin.
William H. Kraske, Consolidated Water Power & Paper Co.—Pennsylvania.

L

James Logan, U. S. Envelope Co.
Frank D. Libby, Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.
Caroline L. Lloyd, American Writing Paper Co.
George Lutz, Invincible Paper and Pulp Co.
C. E. Libby, New York State College of Forestry, Syracuse, N. Y.
P. J. Lameroux, M. & M. Paper Co., Marinette Paper Co., Marinette, Wis.
R. H. Laftman, Bogalusa Paper Co., Inc., Bogalusa, La.
H. F. Lee, Paper Trade Journal, New York City.
O. Lindberg, Port Chemical Works, Springfield, Mass.
Saul Levy, E. Z. Opener Bag Co.
Arthur W. Lamb, Warren Manufacturing Co.
E. C. Lloyd, Bulkley Dunton Company, New York.
J. S. Little, American Chemical Society of the Western Electric Co., Chicago, Ill.
J. Linton, Pawtucket Glazed Paper Co., Pawtucket, R. I.
Frank Larson, American Writing Paper Co., New York.
R. E. Leake, Niagara Paper Mills, Lockport, N. Y.
M. N. Labelle, Chemical Paper Manufacturing Co., Holyoke, Mass.
H. Lippitt, International Paper Co., New York.
W. M. Loveland, Watervliet Paper Co., Watervliet, Mich.
J. A. Lowe, Falulah Paper Co., Montclair, N. J.
M. B. Lowe, Lowe Paper Co., Ridgefield, N. J.
F. E. Lee, United Manufacturing Co.
W. W. Langtry, District of Columbia Paper Manufacturing Co.—Waldorf.
W. J. Lawrence, Western Paper Makers Chemical Co.—Waldorf.
Saul Levy, E-Z Opener Bag Co.—Waldorf.
R. W. Leeper—Vanderbilt.
H. Lippitt, International Paper Co., New York City.
E. R. Low, Beaver Products Co.—Commodore.
W. S. Lucey, Hammermill Paper Co.—Belmont.

M

George M. McKee, Algonquin Pulp and Paper Co.
F. W. Main, Worthy Paper Co. Assn., Mittineague, Mass.
J. O. Mason, Laurentide Co.
H. A. Moses, Strathmore Paper Co., Mittineague, Mass.
D. W. I. Mulford, Crane & Co.
J. D. McLaurin, New York City.
P. S. Miller, Jr., Meade Sales Co., Dayton, O.
H. A. Morrisson, Oliver Continuous Filter Co., New York.
J. E. Miller, Yorkhaven Paper Co., Philadelphia, Pa.
M. E. Moyer, West Carrollton Parchment Co., West Carrollton, O.
A. T. De la Mare, Jr., State College of Forestry.
F. J. Morrisson, Hummel Ross Fibre Co., Hopewell, Va.
E. T. Mathewson, SKF Industries, New York.
H. G. McDowell, Pusey & Jones & Co., Wilmington, Del.
H. S. Mead, Mead Fibre Co.
J. R. Minevitch, Technic-Economical Council of the Russian Paper Industry.
Burton Millar, Paper, New York City.
J. V. McNamara, Internaticnal Paper Co., New York.
Jessie Minor, Collins Manufacturing Co., Flanders, N. Y.
R. Mair, Dillon Collins Co., Philadelphia, Pa.
W. E. McIntyre, McIntyre Brothers Paper Co.
R. F. McElwain, Crocker-McElwain Co.
William G. Mooney, International Paper Co.
R. W. Miller, Central Ohio Paper Co., Columbus, Ohio.
F. A. Milan, Feculose Co. of America, Ayer, Mass.
Irving McHenry, Mid States Drummed Paper Co., Chicago.
W. Meyer, Superior Paper Co., Franklin, Ohio.
L. E. McGrath, Booth Chemical Co., Elizabeth, N. J.
Joe Morris, University of Michigan.
W. H. Millspaugh, Sandusky Foundry and Machine Co., Sandusky, Ohio.
G. Frank Merriam, Holyoke Card and Paper Co., Springfield, Mass.
F. F. Moon, New York State College of Forestry, Syracuse, N. Y.
L. Q. Moffitt, Taylor Wharton Iron and Steel Co., New York.
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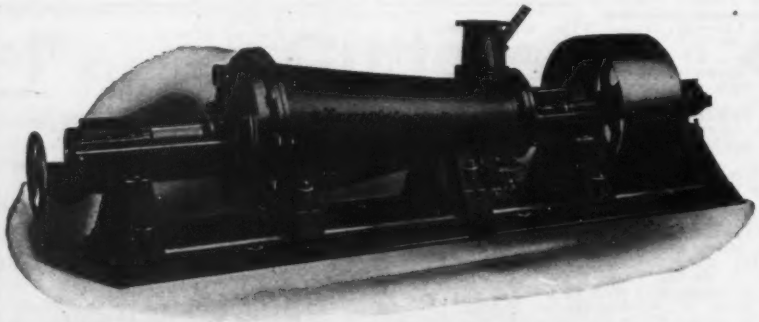

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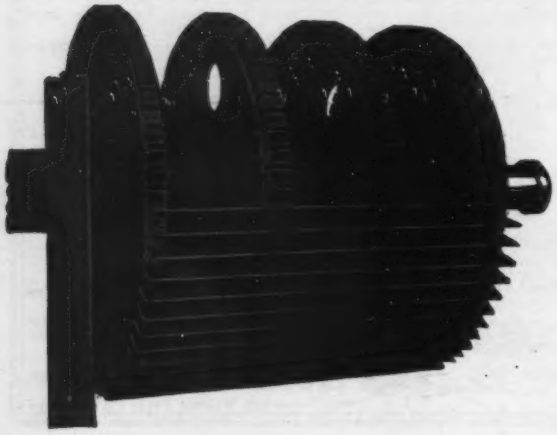

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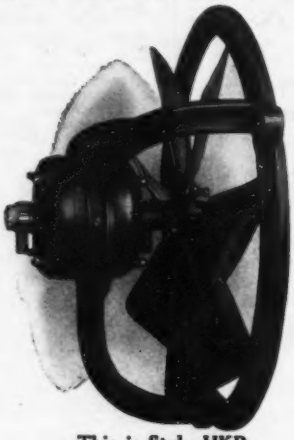

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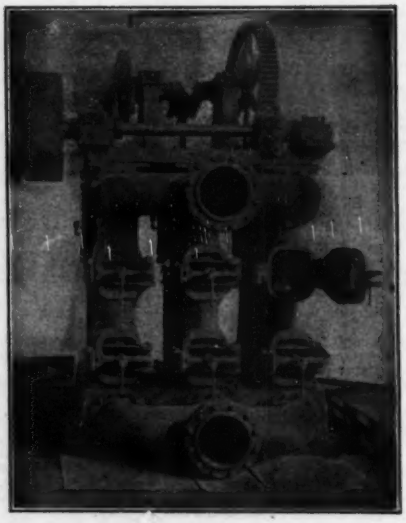

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The Work of the Cost Association

By C. A. Jasperson, Pres., Cost Association of the Paper Industry

This short article is intended as a direct appeal to pulp and paper mill executives to support the Cost Association. Whilst this organization is doing work which indirectly benefits every pulp and paper manufacturer in the United States, its financial support is coming only from a group of broad-minded executives who realize the necessity for such educational work in the industry if it is to be placed on a sound, economic basis. Service is given to the industry as a whole, irrespective of membership in the Association, and in fact, all inquiries relating to accounting subjects or Federal taxes, received by the American Paper and Pulp Association, are handled by our Secretary-Treasurer, who acts as an honorary assistant Secretary for that Association, without pay.

Unfortunately, it has not been found practicable to put into full operation the plan devised by the Finance Committee appointed by the American Paper and Pulp Association last year, whereby the income of this Association would have been collected with the income of the American Paper and Pulp Association through the affiliated associations. This has rendered the work of the financing the Cost Association doubly difficult, and manufacturers therefore are earnestly requested to support the Cost Association until such time as the Finance Committee plan can be put into full operation.

We have been somewhat hampered in our work during the past year through the necessity for careful financing, but we know through developments in some of the affiliated associations that our work is beginning to bear fruit.

C. A. JASPERSON, PRESIDENT OF THE COST ASSOCIATION OF THE PAPER INDUSTRY

Since this work is fundamental, it should be of interest to every manufacturer. It affects your selling prices, and consequently your profits. Selling prices should be predicated on correctly calculated manufacturing costs, but the successful application of the principle of basing selling prices on costs depends upon its general observance by all manufacturers. If in a group of one hundred manufacturers making the same products, ninety-eight are following this sound business principle, and only two through ignorance or even inadvertence, are not doing so, these two can demoralize the whole market by quoting prices without reference to costs, or based upon costs inaccurately determined. The result is almost as bad as if nobody in the group knew how to accurately determine their costs. Paper manufacturers, therefore, who give the matter any thought, whether they themselves have good cost systems, or not, cannot fail to recognize the fundamental character of the work which the Cost Association is attempting to do. It strikes at the root of things. We do not hesitate to say that if it were possible at this Convention to convince every manufacturer of pulp and paper that selling prices should only be based on cost and that extreme care should be taken to get correct costs, the result to the industry as a whole, would be astonishing.

Now that business is improving, the time has come to guard against future losses by seeing

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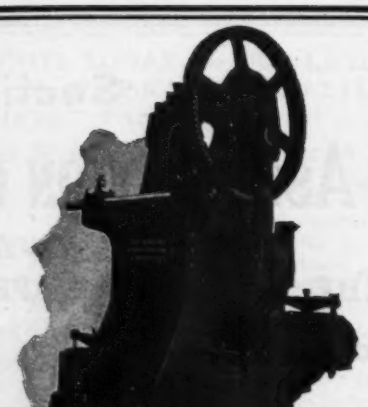

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Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of PAPER TRADE JOURNAL, published weekly at New York, N. Y., for April 1, 1923,—State of New York, County of New York. Before me, a notary public in and for the State and County aforesaid, personally appeared Geo. S. Macdonald, who having been duly sworn according to law, deposes and says that he is the publisher of the PAPER TRADE JOURNAL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit: 1. That the names and addresses of the publisher, editor, managing editor, and business manager are:—Publisher, Geo. S. Macdonald, 10 East 39th street, New York, N. Y.; editor, H. J. Berger, 10 East 39th street, New York, N. Y.; managing editor, H. J. Berger, 10 East 39th street, New York, N. Y.; business manager, Geo. S. Macdonald, 10 East 39th street, New York, N. Y. 2. That the owners are (give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock): The Lockwood Trade Journal Co., Inc., 10 East 39th street, New York, N. Y.; Stockholders: Leslie R. Palmer, 10 East 39th street, New York, N. Y.; J. D. Maley, trustee of the Estate of Charles H. Jones, dead, Daytona, Fla.; J. D. Maley, guardian for Elizabeth, Jocelyn and Kathryn Maley, Daytona, Fla.; Mrs. M. G. Duck, Decatur, Ga.; Dorothy Martyn Freeman, Bat Cave, N. C. 3. That the known bondholders, mortgagees, and other security holders owning, or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are:—There are none. 4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upn the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

GEO. S. MACDONALD, Signature of Publisher.

Sworn to and ..bscribed before me this 9th day of April, 1923.

JESSIE S. NAYLOR,

(My commission expires March 30, 1925.)

to it that your cost department is functioning correctly and effectively. We cannot guard against poor business, but we can guard against big losses. Nobody is obliged to sell paper below cost. If nobody did it it wouldn't be done. One starts, and the rest follow; that is, unless on receipt of reliable information from their cost departments they decide they are *not* in business to make paper, but to make money, which cannot be done by making and selling paper at a loss. There is no real necessity to do this, in spite of the arguments advanced regarding the necessity for holding customers. Customers can be convinced by means of a clear statement of facts regarding costs. They, too, have to sell paper, and know that what they gain when they buy it below cost will have to be made up later when prices rise. This is bad business, because what industry wants is stabilization of selling prices, which can only be brought about legally by a determination on the part of manufacturers that they will not sell below cost, nor boost prices in good times to make up losses incurred in times of depression.

The point at once arises in the mind, what is cost? Each manufacturer must determine this for himself, but the group as a whole may agree to use the same methods in determining their costs, provided, of course, that these methods do not include any so-called "fixed" costs. In other words, the cost system decided upon by the group must be based upon correct cost accounting principles.

Enough has been said to clearly indicate the importance of the Cost Association's work to the industry as a whole, and the officers and Executive Committee therefore confidently appeal to manufacturers in all groups within the industry to give the Association their moral and financial support, thereby making it possible for them to:

1. Reach every manufacturer with their message.
2. Convince him of its importance both to himself and the industry as a whole.
3. Make cost investigations in every group for the purpose of
   (a) Collecting reliable cost data to be used in
   (b) Determining the best cost methods to be adopted as standard by the whole group.
4. Arrange for regular meetings of cost men in each paper making centre for the purpose of discussing matters of general interest to them.
5. Facilitate the installation of the cost methods adopted, by acting in an advisory capacity to executives in connection with their contact with public accountants doing this work.
6. Study all legal decisions having reference to the adoption of standard or uniform cost systems by groups of manufacturers, and co-operate with the Government departments interested in such activities, and thus supply manufacturers with the best possible advice on these matters.

Standard Costs*

By Arthur Lazarus

Standard costs are often referred to as revolutionary or startlingly new. As a matter of fact, such costs present a retreat, but a beneficial retreat, toward earlier cost practices. Not so many years ago manufacturers were content with costing or estimating systems. These gave results, but results that lacked verification until the balance was struck at the end of the accounting period, when such balance frequently revealed that the costing records were far afield and that important items of cost had been overlooked or minimized.

As a reaction to these tabloid but risky cost methods, detailed costs came into use. These gave the required information accurately and in entirety, but the cost information came too late, stressed essential and unessential points and was expensive to gather. A second reaction set in, which provided for cost accounting shortcuts, without the sacrifice of the necessary accounting control, and this last development is generally termed "standard costs."

Standard Costs Variously Used

But it is difficult to discuss standard costs and be certain that your readers or hearers will understand your use of the term, for it is used variously and indiscriminately. There are, for instance, the standard costs for industries, denoting uniform cost methods, and there are the standard costs for manufacturers, which imply a definite time, material or money allowance for a given operation, product or contract. When upon such costs is developed a cost procedure that will watch, catch and explain variations from the standard time, material or money allowances, we have a reasonably clear use of the term standard costs, as developed by the most alert cost expert, even though, for the sake of variety or contrariety, he dubs his cost methods "scheduled," "estimated," "specification" or "pre-determined" costs. "Standard costs," however disguised by a new term, work just as well when properly used. The circumstances in which standard costs may be profitably and properly used will now be set forth, for it is to be remembered that standard costs are not a panacea for all cost ills or troubles.

Standard costs should be used:

1. When actual costs come too late, as in aging processes. Certain phases of steel manufacture take five or six months in process and it is impossible to wait for the completed cost story; hence standard costs must be used by the management for estimating purposes and for purposes of production policies.
2. When actual costs are impossible to obtain, as in by-product industries. It is easy enough to tell the cost of a whole cow, but baffling when the cow is once cut up to determine the costs of the various parts, except upon some reference to a standard, especially for by-products. In most cases this standard is the prevailing market.
3. When actual costs are too expensive. Suppose you are manufacturing toy balloons or a cheap grade of pottery. It would not be feasible for you to secure actual costs by batches or even by processes. In order to cut down the costs of cost accounting, you would have to be content with estimated or scheduled costs, supplemented here and there by tests of actual batches. No one claims that such scheduled or estimated costs are an improvement upon the actual costs; on the contrary, they are only a compromise. They are costs that are not commercially correct, but they are the only kind of costs that the particular process or manufacture can economically bear.

When Actual Costs Are Unnecessary

4. When actual costs are unnecessary. Suppose you are manufacturing the same thing day after day. It would not take you very long to get a firm idea of what the costs ought to be and it would be a waste of money to secure detailed costs where operations were homogeneous or repetitive in character. The story is told of a prominent automobile manufacturer walking into his cost department one fine day and telling the five or six hundred cost clerks employed there that if they wanted jobs, they would better go into the factory, for he had decided to abolish the cost department as unnecessary overhead. The story is probably apocryphal, but some such procedure is within the range of probability, for the particular manufacturer is well known as the producer of

* From *"Journal of Accountancy,"* April, 1923.

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a highly standardized machine, turned out under highly developed methods of operation. It would be possible for the average sash, door and blind mill to disband its cost department, when it caters to a specialized trade and no two jobs are much alike. To the automobile manufacturer detailed costs were unnecessary, standard costs sufficed.

5. When actual costs are not typical. The performance of a factory on any one day may not be fairly representative of its efficiency and such actual performance of a given day cannot be profitably used as a measure of efficiency. In order to have a measuring rod, a standard of performance is established by which to check and compare day-by-day production. The standard cost of a particular operation, process or job, however determined, provides such a measuring rod.

Basis of Fair Comparison

6. To provide a basis of fair comparison between factories manufacturing the same product. Suppose that a large organization runs fifty or sixty factories—of course such organizations exist—and purchases material for these numerous factories at varioue times, how would it be possible to determine the efficiency of these factories if the attempt were made to charge them with material at actual cost? The cost of material may fluctuate with every purchase and from day to day, and the factory managers of the various plants cannot control these fluctuations. Therefore, to place the respective factories upon an equal basis, the material is charged to them by the central organization at a cost that is identical and standard over a period of time. The test of the operating efficiency of the various factories will then lie in the manner in which they convert the purchased material into the finished product.

A theory has arisen that standard costs are inimical to actual costs. The matter is usually thrown open to discussion under the caption "Actual costs versus standard costs." Standard costs are not inimical to actual costs, nor does a belief in the value of standard costs imply an abandonment of actual costs. It is only because actual costs are not always procurable and do not tell the whole story, that resort is made to standard costs. As a matter of fact, there is no enmity between actual and standard costs, but standard and actual costs work hand in hand and are much dependent one upon the other. Standard costs are a refinement of present-day accounting to supplement information not clearly or promptly given by actual costs. The sole question involved is not whether we shall use either standard or actual costs, but whether we shall use standard costs as supplementary to actual costs when such are procurable.

The question in the back of my mind is this: Can standards of cost be best established through test runs or from a record of actual shop performances? I once put this question to a superintendent of costs of an organization that a year or two ago did a business of $75,000,000 and this was his answer:

"I firmly believe that standard costs can be more accurately determined from a record of regular rather than from any test runs. I feel very sure that when a standard cost is developed as the result of even the most careful observation with due allowance for all unforeseen contingencies, the test will not accurately represent the performance. The fundamental reason for this is that the test is under special detailed supervision which the regular day's work cannot have. I think, therefore, that an average taken from performance covered by complete reports will indicate a standard cost which is very much more correct."

Unnecessary Burden in Cost Department

In conclusion, I must express a fear that the agitation for standard costs has in some plants thrust an unnecessary burden upon the cost department and that the cost department is assuming work that properly belongs in the first instance to the engineering or production department. In modern plants there is a standard time for every operation on each piece and a standard allotment of material to be used. Such standard times are the basis of the schedule for the various machines and operations. Progress charts show at once whether or not jobs are running by the standard time. All of this information is derived from the very cards which eventually go to the cost department and are converted into money values. There is nothing to be gained for purposes of control in resolving the actual accomplishment into dollars and cents, for if we control the time and material we control the cost. Or, expressing it in a slightly different way, if we control the time and quantities we can be content to allow the cost to be whatever it may.

THOS. J. BURKE, SECRETARY OF THE COST ASSOCIATION OF THE PAPER INDUSTRY

Cost systems that attempt to check labor performances and material consumption that can be more easily controlled at their source are assuming too heavy an administrative load. Cost results given in terms of dollars and cents are not basic data. The basic data are times and quantities. The value of the dollar fluctuates. The dollar of today is not the dollar of a year ago or a year hence. Consequently comparisons of results expressed in dollars and obtained at different times are difficult to make.

On the other hand, an hour is always an hour and a pound is always a pound and comparisons of times and quantities require no special allowance or considerations. Such information is of continuing usefulness. Accordingly, why not in the first place for purposes of shop control compare performances in terms of time and quantities?

Summing up, standard costs, when based upon the necessary elemental data, provide excellent cost short-cuts, but standard costs are not designed to do the work of the planning, engineering or production departments.

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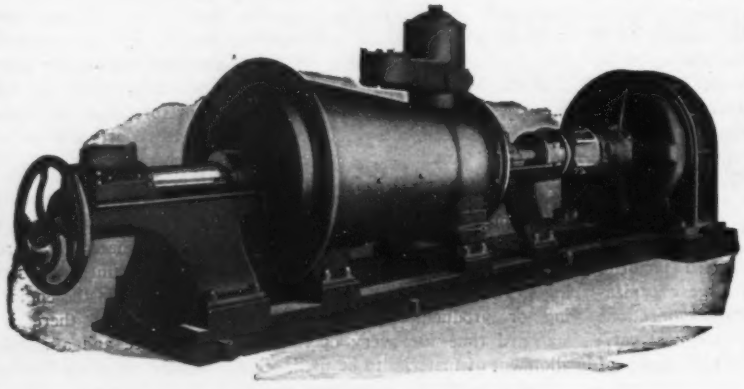

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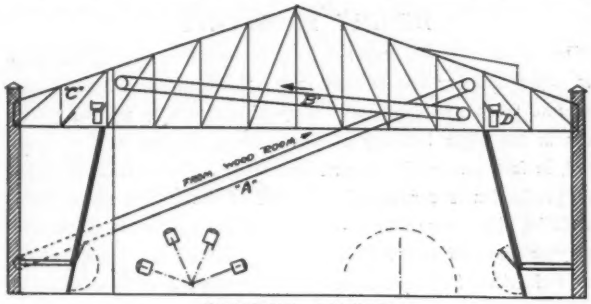
SPECIAL OVERHEAD BLOCK CONVEYOR SYSTEM

The wood-room in the pulp mill of the Inland Empire Paper Company at Millwood, Wash., adjoins, but is eight feet above the floor of the grinder room. Before the enlargement two years ago of this latter part of the mill, there was but one row of grinders and the conveyor from the wood-room merely dropped the two foot blocks through the wall into one end of the grinder room. The difference in floor level allowed quite a pile to accumulate under the end of the conveyor from which small trucks were loaded and pushed up to a place near the grinders convenient for loading them. This was costly in time and occasionally when the wood room sent through a surplus of blocks to take care of a short shut-down of the saws or barkers it was necessary to pile the blocks often as high as the trusses to clear the conveyor. Many injuries also resulted from picaroons and falling blocks.

When the plans were being considered for enlarging the room to accommodate a two row layout of grinders it was seen that some other method must be devised for handling these blocks. The one decided upon was a plan which called for two flat lengthwise drag chain conveyors, "C" and "D," mounted in the roof trusses—one near each wall, and two inclined conveyors, "A" and "B," crossing each other at that end of the building next to the wood room. One of these latter, "A," serves to elevate the blocks and feed the lengthwise members of the system, one directly and the other by means of a diversion chute to the second inclined conveyor "B" which dumps into the second lengthwise member "C."

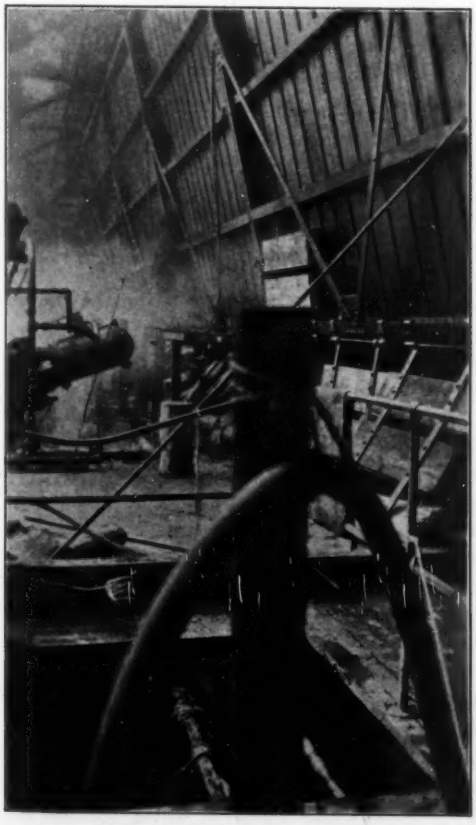
Under the lengthwise conveyors are constructed steel storage hoppers using the wall for a back and making a front out of 12" channel irons inclined toward the wall. These channels are spaced 2" apart to permit a pike to be used to dislodge any blocks should any "arching over" or clogging occur.

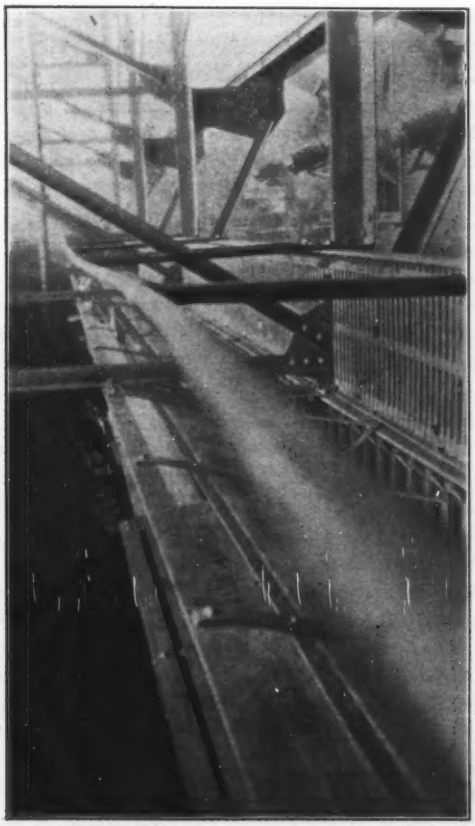
The front of the hopper is open for about three feet off the floor allowing the blocks to feed out within convenient distance for the grinder operator.



CONVEYOR LAYOUT

The lengthwise conveyors are made up of standard 16' (purlin span) sections and in the center of each section a shearing blade is mounted, controlled from the floor, which when not in use swings clear but can be swung across the conveyor and shear the blocks from the chain dropping them into the center of whatever bay conditions may require.


VIEW SHOWING HOPPER AND SWING DOOR


UP IN THE TRUSSES LOOKING ALONG FROM WOOD ROOM

Editorial

Vol. LXXVI New York, April 12, 1923 No. 15

HENRY J. BERGER, Editor

BRIGHT PROSPECTS

The annual reviews prepared by representative men in the pulp and paper industry and printed in this issue of the PAPER TRADE JOURNAL tell a pretty uniform story of a return to normal conditions in the paper industry of this country. In the case of news print, in fact, a new high record was reached during 1922, if Canada's production is considered with that of the United States as it should be, since more than 80 per cent of the production in Canada last year was sold in the United States. Taking into consideration the production of the two countries the production of news print in 1922 exceeded by almost 150,000 tons the previous high record of nearly 2,400,000 tons which was made in 1920. This record, judging from present indications, is almost certain to be considerably exceeded during the current year because of the new mills that will come into operation and the mill improvements that are being made, practically all of them, however, in Canada. Consumption also increased greatly as is indicated by the fact that it was 19 per cent greater than in 1921 and 16 per cent greater than in the previous record year of 1920.

As usual news print reflected the improved conditions earlier than other lines of paper, starting immediately with the beginning of the year and continuing an almost uninterrupted increase until the present time. By the midyear book, wrapping, tissue, boards and writing had gathered good momentum and in most of these lines production at the present time is fully normal or pretty nearly approaches it.

All varieties of paper making materials by the beginning of summer of last year also had begun strongly to evidence the return of more active conditions in the paper industry. This was especially true of mechanical pulp, which, during the fall began to be in such limited supply that prices appeared a minor consideration and $50 per ton and more in some instances was obtained. The price situation was, of course, considerably strengthened by the severe winter, which greatly restricted grinding operations.

Chemical pulp also strongly showed the return of better times beginning with the summer and continuing through the fall, and the situation in addition to the expanding demand has been strengthened also by the strike in the pulp mills of Sweden, which has just been settled after a duration of about three months.

Practically all varieties of paper makers' supplies have advanced during the year. This is especially true of casein, which a year ago at this time was selling at 10 cents per pound and is quoted today at from 22 to 25 cents. This increase is due to the new tariff, which paper makers consider unreasonable and unfair and which, it is good to know, gives promise of being adjusted to a fairer basis soon.

The change in the tariff in September was, of course, one of the outstanding features of the year in the paper trade. While the change in the rates on paper did not meet with the unanimous approval of paper men the new arrangement is quite generally believed to be an improvement over the old rates and it is felt, especially as conditions in Europe become more settled, that it cannot fail to benefit the domestic industry.

Along with the cost of paper makers' supplies wages have been advancing and this tendency promises to continue for some time. In fact costs of production generally show a strong upward tendency all along the line and this almost certainly means higher paper prices. Paper men have been endeavoring to avoid this but if it becomes necessary to increase prices it may be assumed that it will be done conservatively, as manufacturers have learned by sad experiences only recently that an unstabilized market, even though it may bring temporary gain, is not a good thing in the long run.

The past year may be said to average up fairly good. The outlook is bright and if pulp and paper manufacturers operate conservatively, as they are likely to, 1923 should be a more than ordinarily good year.

PAPER WEEK A BIG SUCCESS

Paper week in New York has been a big success. Not only was the attendance at the convention of the American Paper and Pulp Association and its affiliated organizations as well as the convention of the National Paper Trade Association, the largest in the history of these gatherings but the interest manifested at all of the meetings was of gratifying character.

The substantial nature of the work accomplished by the Technical Association is evidenced by the numerous valuable papers which were presented at the convention and many of which are printed elsewhere in this issue of the PAPER TRADE JOURNAL. The earnest endeavors of the officers constantly to expand and improve this association, through which the entire industry is bound to profit so materially, cannot be too highly commended. Among the newer organizations the Salesmen's Association of the paper industry and the Woodlands Section also had meetings which demonstrated that they deserve the unqualified support of all the members of the industry.

The meetings and banquets of the American Paper and Pulp Association and the National Paper Trade Association also reflected great credit on the officers and gave paper and pulp men, whether manufacturers or merchants, in every branch, cause to be proud of the business with which they are connected.

Paper men will regret to see Mr. W. J. Raybold retire from the presidency of the American Paper and Pulp Association. He has filled the important office during a period that has been more than usually filled with perplexing problems with much credit to himself and to the entire satisfaction of the members of the association. Mr. Henry W. Stokes, president of the York Haven Paper Company of York Haven, Pa., who has just been elected to head the association, has long been actively connected with the organization and his good work of late years on several important committees indicates that he will prove a worthy successor to Mr. Raybold and some of the more able paper men who have headed the association in the past. The work of Dr. Hugh P. Baker, the executive secretary of the association and his staff of able assistants, deserves the greatest praise. Never has so much constructive work been accomplished as during his term of office and perhaps never has there been so great need for a man of his

caliber in this office. In view of these circumstances it is regrettable to learn that the finances of the association are not on as substantial a basis as they might be. As Dr. Baker remarked in his annual report the association is either worth while or it is not and if not it should be discontinued and otherwise it should receive more spontaneous financial support than it has recently. It is to be hoped that this simple announcement by Dr. Baker will have the effect of remedying the inadequate finances.

A new feature of Paper Week this year, and by no means the least important was the Paper Industries Exposition at the Grand Central Palace. This was undertaken at the suggestion of the American Paper and Pulp Association after consideration for a number of years past and was a well deserved success. Not only was the exposition visited constantly throughout the week by pulp and paper men from all over the country and Canada, but converters and large consumers of paper and the public generally also attended in great numbers. The exposition probably did more than any single thing ever has previously to stimulate interest in paper and to impress the great importance of the paper industry in this country on those not connected directly with the paper business.

The Paper Industry Exposition certainly seems a fixed institution for future Paper Weeks in New York, and some men, whose opinions are worth while are already predicting that the success of the New York Paper Show will, if not this fall, certainly in the course of time cause a similar show to be held in connection with the annual fall business conference of the American Paper and Pulp Association in Chicago.

PAPER IMPORTS AND EXPORTS

The total value of imports of paper except printed matter during the calendar year 1922 was $85,914,879, according to John Matthews, Jr., chief of the Paper Division of the Department of Commerce. This amount is in comparison with $88,673,487 for 1921 and only $16,047,128 during 1913. By way of further comparison it is interesting to note that our exports of a similar schedule of paper commodities for the three periods were $24,152,557, $29,029,673 and $11,248,102, respectively.

As in past years, news print supplied the greater part of the imports with 1,029,268 short tons valued at $72,354,266 in 1922 against the 792,508 short tons and $79,125,355 in 1921. The very sharp comparison between imports and exports of paper is materially softened when we notice that of the total of the former 896,314 short tons valued at $54,127,112 were news print from the various provinces of Canada. If, for the moment, we do not consider that item in the light of other imports and deduct it from the total, a balance of trade in our favor of $2,364,800 appears.

Of the other main items imported during 1922, paper boards rank first in quantity, with 33,681 short tons worth $1,714,766, 32,931 short tons of wrapping paper came in priced at $2,764,437, while the total import of "other printing paper" was 2,599 short tons at $320,302, nearly four times the amount of 1921.

The total value of exports of paper from the United States, exclusive of printed matter during January, 1923, according to figures compiled by the Paper Division of the Department of Commerce, show an increase of about 14 per cent over those of January, 1922; but decreased about 9 per cent, as compared with December of the same year. Book paper and wrapping paper maintain the same trend of decline from December, but show an increase over the preceding January. The increase in price of boards, which came between January and December, 1922, is reflected in the figures for paperboard and strawboard. Evidently the domestic market is absorbing a steadily increasing quantity of news print, for the exports of that commodity show a decline both in quantity and value.

Canadian exports of paper, wood pulp and pulpwood for January, 1923, according to the Dominion Bureau of Statistics, were valued at $11,494,129, an increase of $1,965,706, as compared with January, 1922, and an increase of $408,315 above similar exports for December, 1922.

Exports of news print, which represented the largest item, amounted to 165,578 long tons, valued at $6,134,827. Pulp shipments reached 139,749 tons, valued at $3,693,268, of which mechanical pulp represented 59,784 tons, valued at $994,917. The remainder was fairly evenly divided as to quantity between sulphate, unbleached and bleached sulphite, the value of the last mentioned being given as $1,201,330. Pulpwood exports amounted to 133,328 cords, valued at $1,195,886.

The bulk of the paper and pulp exports came to the United States, shipments to this country reaching a value of $10,482,072.

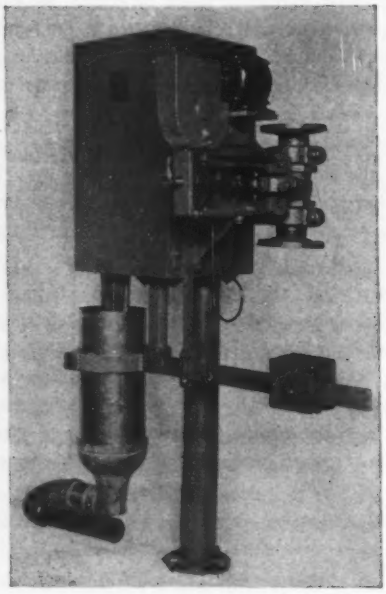
BACKUS-BROOKS ORDER NEW MACHINE

The Dominion Engineers Works at Lachine, a suburb of Montreal, have an order to construct a 234 inch news print machine for the new mill of the Backus-Brooks Company, Kenora, Ont. The machine will be one of the largest in Canada. It is designed for a capacity of 100 tons per day, and will operate at speeds up to 800 feet per minute. D. McLeod, resident vice-president of the company, states that the companys' plans in connection with its new pulp and paper mills are rounding out satisfactorily. During the coming season the company intend to construct a news print mill of 100 tons' capacity. According to Mr. McLeod, sulphite pulp for the company's requirements will be purchased from other sources for the present. Wood supply is now being secured from the Lake of the Woods pulp limit and from settlers, and following further extension of the plant, additional wood supply will be secured from the English river pulp and timber limits. "To tap this source," says Mr. McLeod, "it will be necessary for us to build 30 or 40 miles of railway and to serve which an additional 100 to 150 miles will be required. Paper will be shipped to the most favorable market, and we hope to be able to serve Winnipeg and the western provinces. We have placed in operation the first unit of our groundwood mill, having a capacity of 80 tons. We have completed the installation of four new units in the hydro-electric plant purchased by us from the municipality, and we are now arranging for an additional six units to replace the old units.

This work will be done this year, and when completed will give us an entirely new power station with a capacity of approximately 12,000 h. p."

BONUS PLAN FOR NORTHERN PAPER MILLS

A bonus plan for men employed on paper machines of the Northern Paper Mills, Green Bay, is being worked out by W. A. Kelly, mill manager, as a result of a conference of the machine workers with Judson G. Rosebush, general manager of the company, following announcement of a wage increase for all other employees of the mill effective on April 1. The bonus system, if it can be worked out satisfactorily, will be retroactive to March 1.



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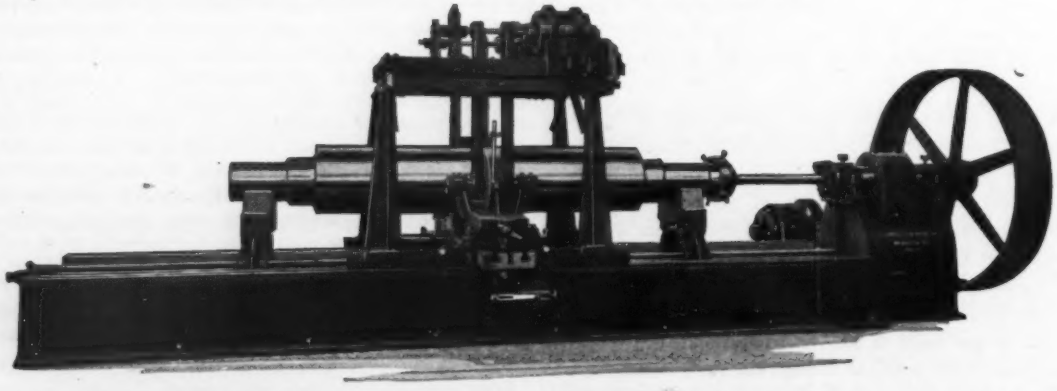

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Obituary

Kennedy B. Fullerton

Kennedy B. Fullerton, to a large circle of friends in the paper trade affectionately known as the Judge, died Tuesday, April 10, at Brookline, Mass., where he had made his home since last fall. Mr. Fullerton was graduated from the Brooklyn Collegiate and Polytechnic Institute in 1872 with the degree of B. A. and from Columbia University in 1877 with LL. B. Entering the paper trade, he early attracted the attention of Albrecht Pagenstecher, who owned the controlling interest in the Hudson River Pulp & Paper Company, now a part of the International Paper Company and for many years Mr. Fullerton sold the product of this mill. In 1884 the Manufacturers Paper Company was formed by Mr. Pagenstecher, Mr. Fullerton and F. W. Bidwell. Mr. Fullerton was the first secretary of this company, later becoming first vice-president and general manager. He was also one of the organizers of the St. Regis Paper Company, and for a number of years a member of its board of directors.

In January, 1910, Mr. Fullerton retired from active business. Being interested in agriculture as a hobby, he passed his remaining years in developing a large farm on the Thames River between New London and Norwich, Conn., generally spending his winters in the South or in California. He remained as a director in the Manufacturers Paper Company and the Shawmut Manufacturing Company until his death.

Frederick A. Ritchie

Frederick A. Ritchie died on April 7 at the St. John Infirmary, St. John, N. B., as a result of heart failure. He was taken ill while returning from a trip to Demerara, West Indies, and on reaching St. John was forced to enter a hospital. Mr. Ritchie had not been in good health for some time past, but was able to attend to business until February 13, when he left on an extended winter vacation, which had been his custom for many years. The body was brought to Toronto for interment, and the funeral, from the family residence, 620 Avenue Road, was attended by a large number of friends in the paper trade.

Mr. Ritchie was president of the firm of Ritchie & Ramsay, Limited, coated paper manufacturers, New Toronto. They organized the first coated paper mill in the Dominion in 1892, and from a small beginning built up a business which extended to all parts of Canada. Previous to launching out in his own behalf with C. N. Ramsay, Mr. Ritchie was engaged on the sales staff of the Canada Paper Company, Windsor Mills, Que., while Mr. Ramsay was employed in the manufacturing department. They joined forces and their efforts met with a large measure of success.

Mr. Ritchie was a member of the National Club, Royal Canadian Yacht Club, Toronto, and other organizations. He is survived by his wife, three daughters and two sisters, the latter residing in Montreal. He enjoyed a wide measure of esteem in the trade and his death created genuine sorrow among a large circle of business associates.

Edward J. Bernholz

Edward J. Bernholz, dealer in rope and twine, 280 Madison avenue, New York, died April 5. He was ill but for a short time and a sudden turn for the worse resulted in his death.

He was born on December 31, 1861, and entered the employ of the Travers Brothers in 1878. He was with them until the dissolution of that firm in 1909, when he started in business for himself and was actively in this business up to the time of his last illness. His sons, Edward L. and Thomas F. Bernholz, will continue business as before.

GEORGE A. GALLIVER RESIGNS

The resignation of George A. Galliver as president and director in the American Writing Paper Company the past week at a meeting of the executive committee on Wednesday of last week, came as a great surprise to the trade and is considered in Holyoke to have been the result of increasing differences of opinion among the members of the board of directors that culminated in the meeting of last week. Mr. Galliver told your correspondent that he left with the best of feeling towards the board of directors. Mr. Galliver's letter of resignation follows:

"My dear Mr. Rosen: In the interests of the harmony of your board and of my relations with it and of my own self-respect, I beg to tender you my resignation as president and as a director of the American Writing Paper Company to take effect at once.

"In doing this, I wish to say that the work that has been done under my administration to establish and stabilize the production and the demand for the products of the company will insure the success of the company, in so far as this work is carried forward by your board. The standardization and the policies that I have developed in the company and through it in the fine paper industry, are basic and must be maintained.

"The impetus toward the ultimate success of the company that these things have brought about is certain of remuneration to the stockholders, particularly with the augmentation in demand which is now in evidence for products adaptable to the company's mills.

"I consider its construction work well over and well done. It should now come into its own as a money-maker. It is regarded today as an institution having character and dependability.

"My best wishes are with the company. I wish to see it a success. The detail of the management is something enormous and difficult of appreciation on the part of the board members. I shall esteem it a privilege to give information or advice to any of its personnel, if desired, at any time."

Speaking of his resignation Mr. Galliver said that he could not conscientiously accept of certain plans that were proposed and chose to withdraw, thereby making, as he considered, an important move towards the harmonizing of differences that promised eventually to become acute.

He plans to locate in or near New York City, where he will again take up the work of financing concerns as had been his business previous to his joining the American Writing Paper Company in January, 1918. He is considered to have been the most successful of the presidents that have been at the head of the big company.

SEARS, ROEBUCK & CO. ACQUIRE MILL

Announcement was made last week that Sears, Roebuck & Co., Chicago mail order house, has acquired all the common stock in the Lakeview Paper Company, a Neenah, Wis. The announcement was made by A. J. McKay, manager of the Combined Locks Paper Company.

Mr. McKay's statement follows:

"Sears, Roebuck & Co., the Chicago mail order house has acquired all the common stock of the Lakeview Paper Company. The mill is located at Neenah and has been manufacturing book paper. It is not now known what grade of paper will in the future be made in this mill."

The property was secured from stockholders of the Lakeside Paper Co., builders of the mill, about three years ago by a group of men prominently connected with the Combined Locks Paper Company. The general office of the Lakeview Company was in connection with the Combined Locks Paper Company office in Appleton.

No announcement has been made by the new owners of the kind of paper that will be made. It is not now known if any improvements or additions are contemplated.

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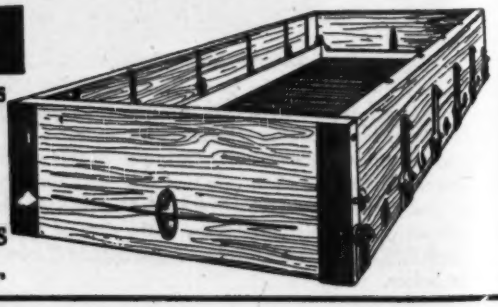

Imports and Exports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING APRIL 7, 1923

SUMMARY

News Print.....1,061 rolls.
Wrapping Paper.....2,031 bls., 9,063 rolls.
Cigarette Paper.....1,742 cs.
Hangings.....18 cs., 68 bls.
Packing Paper.....5,231 bls.
Filter paper.....21 cs., 105 bls.
Printing Paper.....26 cs., 120 rolls.
Drawing Paper.....56 cs.
Writing Paper.....39 cs.
Surface Coated Paper.....30 cs.
Miscellaneous Paper.....512 bls., 4,316 rolls.

CIGARETTE PAPER

Zorn Tobacco Co., Asia, Lisbon, 12 cs.
P. J. Schweitzer, Pittsburgh, Southampton, 15 cs.
P. J. Schweitzer, Ville d' Djiboute, Marseilles, 93 cs.
Rose & Frank, Olympic, Southampton, 12 cs.
American Tobacco Co., Schodack, Bordeaux, 1,050 cs.
R. J. Reynolds Tobacco Co., Schodack, St. Nazaire, 350 cs.
De Manduit Paper Corp., by same, 210 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., Maine, London, 40 bls.
W. H. S. Lloyd & Co., by same, 9 cs.
W. H. S. Lloyd & Co., Missouri, London, 9 cs.
W. H. S. Lloyd & Co., by same, 28 bls.

WALL PAPER

A. C. Dodman, Jr., Olympic, Southampton, 3 bls.
A. C. Dodman, Jr., by same, 3 cs.
A. Murphy & Co., Majestic, Southampton, 1 bl.
R. F. Downing & Co., Maine, London, 6 bls.
Meadows, Nye & Co., by same, 6 cs.
The Prager Co., Finland, Antwerp, 6 bls.
A. Murphy & Co., La Savoie, Havre, 7 bls.
A. C. Dodman, Jr., Cedric, Liverpool, 9 bls.
A. Murphy & Co., Aquitania, Liverpool, 2 bls.
A. Murphy & Co., Muensterland, Hamburg, 8 bls.

PACKING PAPER

Republic Bag & Paper Co, Muensterland, Hamburg, 3,407 bls.
Republic Bag & Paper Co., Norwich City, Hamburg, 1,824 bls.

WRAPPING PAPER.

D. S. Walton & Co., Drothingholm, Gothenburg, 5 bls.
A. E. MacAdam, by same, 98 bls.
A. E. MacAdam, by same, 2,535 rolls.
American Express Co., by same, 2,096 rolls.
Chemical Nat'l Bank, by same, 1,591 rolls.
Chemical Nat'l Bank, by same, 63 bls.
F. A. Munsey Co., by same, 202 bls.
F. A. Munsey Co., by same, 82 rolls.
Wilkinson Bros. & Co., Inc., Tyrifjord, Trondhjem, 6 bls.
Fernstrom Paper Co., Inc., by same, 174 bls.
Fernstrom Paper Co., Inc., by same, 333 rolls.
Fernstrom Paper Co., Inc., Tyrifjord, Bergen, 3 rolls.
Wilkinson Bros. Co., Inc., by same, 122 bls.
Blauvelt, Wiley Paper Mfg. Co., Tuscania, Glasgow, 7 bls.
Blauvelt, Wiley Paper Mfg. Co., by same, 31 rolls.
J. Munroe & Co., Minsterland, Hamburg, 2,692 rolls.
Irving Bank Columbia Trust Co., by same, 20 bls.
Equitable Trust Co., by same, 722 bls.
Birn & Wachenheim, by same, 11 bls.
M. O'Meara Co., by same, 301 bls.
Ladenburg, Thalman & Co., Georgia, Trieste, 200 bls.

FILTER PAPER

J. Manheimer, Majestic, Bordeaux, 105 bls.
Nat'l City Bank, Buckleigh, Marseilles, 1 cs.
H. Reeve Angel & Co., Inc., Maine, London, 15 cs.
E. H. Sergeant & Co., Drotningholm, Gothenburg, 5 cs.

NEWS PRINT

Newsprint Paper Corp., Drotningholm, Gothenburg, 319 rolls.
M. Gottesman & Co., Inc., by same, 237 rolls.
Corn Exchange Bank, Norwich City, Hamburg, 303 rolls.
Chemical Nat'l Bank, Volendam, Rotterdam, 232 rolls.

PRINTING PAPER

Miller & Wright Paper Co., Volendam, Rotterdam, 2 cs.
B. F. Drakenfeld & Co., Cedric, Liverpool, 24 cs.
Chemical Nat'l Bank, Norwich City, Hamburg, 76 rolls.
Reggin & Martin, Missouri, London, 44 rolls.

DRAWING PAPER

Keuffel & Esser Co., Munsterland, Hamburg, 54 cs.
H. Reeve Angel & Co., Inc., Maine, London, 2 cs.

WRITING PAPER

E. Dietzgen & Co., Asia, Marseilles, 39 cs.

SURFACE COATED PAPER

Genaert Co. of America, Finland, Antwerp, 30 cs.

PAPER

C. K. MacAlpine Co., Drotningholm, Gothenburg, 156 bls.
C. K. MacAlpine & Co., by same, 268 rolls.
M. O'Meara Co., by same, 5 bls.
Wilkinson Bros. & Co., Inc., by same, 232 bls.
Wilkinson Bros. & Co., Inc., by same, 1,547 rolls.
J. D. Heffernan Paper Co., by same, 493 pgs.
Perry Ryer & Co., Tuscania, Glasgow, 72 bls.
American Exchange Nat'l Bank, Norwich City, Hamburg, 26 bls.
Fernstrom Paper Co., Inc., by same, 1,177 rolls.
Blauvelt, Wiley Paper Mfg. Co., by same, 20 rolls.
D. S. Walton & Co., by same, 987 rolls.
Melby, Kuttroff & Co., Fred VIII., Copenhagen, 317 rolls.
Stern Bros., La Savoie, Havre, 9 cs.
A. Flinn & Co., by same, 3 cs.
Whiting & Patterson, by same, 9 cs.

RAGS, BAGGINGS, ETC.

Castle & Overton, Buckleigh, Barcelona, 8 bls. rags.
Castle & Overton, Angela, Barcelona, 123 bls. jute waste.
E. J. Keller Co., Inc., Idaho, Newcastle, 323 bls. rags.
Guaranty Trust Co., Idaho, Hull, 8 bls. rags.
Guaranty Trust Co., Cardigan, Bordeaux, 1,146 bls. rags.
Goldman, Sachs & Co., Cardigan, Havre, 246 bls. rags.
Kidder, Peabody Acc. Corp., by same, 95 bls. rags.
Bernard, Judae & Co., by same, 264 bls. rags.
New York Trust Co., by same, 72 bls. rags.
Royal Manufg. Co., W. Inskip, Antwerp, 75 bls. cotton waste.
American Exchange Nat'l Bank, by same, 32 bls. bagging.
E. J. Keller Co., Inc., by same, 144 bls. bagging.
E. J. Keller Co., Inc., by same, 47 bls. rags.
M. O'Meara Co., by same, 188 bls. rags.
E. J. Keller Co., Inc., Georgia, Trieste, 305 bls. rags.
Waste Material Trading Corp., by same, 559 bls. rags.
E. J. Keller Co., Inc., Finland, Antwerp, 146 bls. flax waste.
Irving Bank, Columbia Trust Co., by same, 410 bls. flax waste.
Irving Bank, Columbia Trust Co., N. Range, Leith, 144 bls. waste paper.
E. J. Keller Co., Inc., N. Range, Dundee, 92 bls. jute waste.
Castle & Overton, by same, 755 bls. paper stock.
Castle & Overton, Pittsburgh, Bremen, 117 bls. bagging.
Salomon Bros. & Co., by same, 105 bls. rags.
H. Muehlstein & Co., Inc., by same, 111 bls. rags.
First Nat'l Bank of Boston, Vde Djiboute, Marseilles, 37 bls. rags.
Irving Bank, Columbia Trust Co., by same, 211 bls. paper stock.
Royal Manfg. Co., Vde Djiboute, Genoa, 190 bls. cotton waste.
Irving Bank, Columbia Trust Co., Tuscania, Glasgow, 53 bls. paper stock.
E. J. Keller Co., Inc., Norwich City, Hamburg, 49 bls. new cuttings.
E. J. Keller Co., Inc., by same, 57 bls. bagging.
M. O'Meara Co., by same, 39 bls. paper stock.
J. M. Jaffe, by same, 212 bls. rags.
Salomon Bros. & Co., by same, 457 bls. flax waste.
Corn & Iron Nat'l Bank, Volendam, Rotterdam, 55 bls. bagging.
C. G. Keferstein, by same, 208 bls. rag pulp.
Chemical National Bank, by same, 220 bls. bagging.
Castle & Overton, by same, 15 bls. rags.
Castle & Overton, Schodack, St. Nazaire, 351 bls. rags.
Nat'l City Bank, Schodack, Bordeaux, 322 bls. rags.
Guaranty Trust Co., by same, 405 bls. rags.
Katzenstein & Keene, Inc., by same, 67 bls. rags.
Katzenstein & Keene, Inc., Gasconier, Antwerp, 211 bls. bagging.
E. J. Keller Co., Inc., Caucasier, Antwerp, 914 bls. flax waste.
E. J. Keller Co., Inc., by same, 107 bls. rags.

OLD ROPE

Brown Bros. & Co., Volendam, Rotterdam, 131 coils.
Brown Bros. & Co., Maine, London, 78 coils.
Brown Bros. & Co., Siam City, London, 138 coils.
Int'l Acceptance Bank, Tuscania, Glasgow, 47 coils.
Bemis Bros. Bag Co., Otterburn, Barcelona, 36 coils.
E. J. Keller Co., Inc., Vde Djiboute, Alger, 147 coils.
W. Schall & Co, Buckleigh, Barcelona, 55 coils.
Irving Bank, Columbia Trust Co., W. Inskip, Antwerp, 70 coils.

WOOD PULP

J. Andersen & Co., Georgia. Trieste, 1,560 bls.
Castle & Overton, Pittsburgh, Bremen, 201 bls, 42 tons.
Castle & Overton, Munsterland, Hamburg, 550 bls., 110 tons.
Tidewater Panermills Co., Bornholm, Liverpool, N. S., 12,351 bls.
Wilkinson Bros. & Co., Inc., Drottingholm, Gothenburg, 86 bls. wood pulp boards.

CASEIN

Atterbury Bros., Western World, Buenos Aires, 1,000 bags.
Bank of America, by same, 751 bags.
Kalbfleisch Corp., by same, 1,666 bags.
T. M. Duche & Sons, by same, 417 bags.
T. M. Duche & Sons, Schodack, Bordeaux, 233 bags.
Martine Cantine Co., by same, 183 bags.
Monite Waterproof Glue Co., by same, 50 bags.
Brown Bros. & Co., Missouri, London, 350 bags.
A. Hurst & Co., Olympic, Southampton, 60 bags.
T. M. Duche & Sons, T. Fagelund, Buenos Aires, 2,832 bags.

CHINA CLAY

C. B. Richard & Co., Wells City, Bristol, 150 bags.

PHILADELPHIA IMPORTS

WEEK ENDING APRIL 7, 1923.

Paper House of Pennsylvania, W. Inskip, Antwerp, 217 bls. news print.
Paper House of Pennsylvania, by same, 224 rolls news print.
Johnston Paper Co., by same, 73 rolls news print.
H. Reeve Angel & Co., Inc., by same, 2,264 rolls, news print.
H. Reeve Angel & Co., Inc., by same, 1,318 bls. news print.
H. Reeve Angel & Co., Inc., Norwich City, Hamburg, 470 bls. news print.
H. Reeve Angel & Co., Inc., by same, 375 rolls news print.
Chemical Nat'l Bank, by same, 85 rolls news print.
Chemical Nat'l Bank, by same, 246 rolls news print.
Waste Material Trading Corp., Eglantine, Havre, 349 bls. rags.
Columbia Bank, by same, 62 bls. rags.
Mechanics & Metals Nat'l Bank, by same, 1,114 bls. rags.
Castle & Overton, by same, 168 bls. rags.
New York Trust Co., by same, 39 bls. rags.
E. J. Keller Co., Inc., by same, 380 bls. rags.
American Wood Pulp Corp., by same, 404 bls. rags.
Mechanics & Metals Nat'l Bank, Eglantine, Bordeaux, 331 bls. rags.
W. Schall & Co., by same, 352 bls. rags.
New York Trust Co., by same, 83 bls. rags.
Columbia Bank, by same, 241 bls. rags.
Columbia Bank, W. Inskip, Antwerp, 511 bls. bagging.
E. J. Keller Co., Inc., by same, 122 bls. bagging.
E. J. Keller Co., Inc., by same, 1,540 bls. bagging.

(*Continued on page* 384)

New York Market Review

OFFICE OF THE PAPER TRADE JOURNAL.
WEDNESDAY, April 11, 1923.

With the exception of the fact that the long heralded Paper Week is at hand and dealers and manufacturers in the New York trade have practically suspended operations for the duration of the Convention and Paper Industries Exposition, perhaps the outstanding item of interest to the New York market is the announcement of a complete arbitration in the Swedish pulp lockout. Early in the week the Swedish Consulate General received official information from its home government to the effect that the strike was definitely settled. This advice was supplemented by similar information received by various importers in the city, but it is understood that the Swedish Cellulose Association has not, up to this writing, confirmed the government reports.

The settlement of labor difficulties in Sweden before the first open water shipments are made will, undoubtedly, be received as a welcome indication by paper manufacturers of the United States. Since the inception of the strike, shortly after the first of the year, an increasingly firmer tone has manifested itself in the various pulp markets and the strength of the market has been supported by occasional quotational advances. In view of the fact that stocks on hand in Sweden are now at a very low ebb, when the consuming demand of England, continental Europe and the United States combined is considered, it is quite improbable that any softening in current market values will result from the strike settlement for some time to come. Prices are, in fact, inclined upward, and since the gains in chemical pulp prices of late have been made so gradually, it is believed the market occupies a very solid position. Several New York importers are of the impression that prices of foreign pulps will continue to rise for at least another month, during which time the pulp mills of Sweden, run down from approximately three months' disuse, will barely have opportunity to "get back on their feet."

News print manufacturers reported that consignments were moving forward with satisfactory speed and transportation conditions were generally easier. Ground wood prices reacted to a further recession in the course of the week and quotations on pine spruce, mechanical pulp, f. o. b. New York fell slightly below the forty dollar mark. This condition in the most important raw material market which caters to the news print industry is having the effect of assuring the permanence of news print supply for the balance of the spring months, and is accepted by manufacturers as a welcome indication after the shortage which has impended since before Christmas.

Book paper held in steady call throughout the week and one large New York producer expressed the opinion that the current month would be the best in point of sales that has yet been experienced this year. Book exports to Latin America have continued to gain volume and this activity combined with the unusually heavy domestic demand is crowding the mills to capacity.

Practically the same situation prevails in the fine paper field and it has been unofficially stated that a dozen or more of the larger fine paper concerns were last month oversold to the extent of 20 to 25 per cent of their production capacity.

Tissue paper demand showed a slight softening in the course of the past week and although there were no corresponding lowerings in prices several officials in the trade were of the belief that the price tone of the market was apt to reflect the slightly easier ground wood values which have come during the past ten days to two weeks. The early spring demand from the textile trades for all grades of tissue paper is now beginning to assert itself and the industry as a whole optimistically looks forward to a continuance of the sound activity which has prevailed for some weeks.

Wrapping paper showed practically no change during the week. Board prices ruled fairly steady during the week and although a few discrepancies were noticeable amongst the quotations on news and chip grades from various New York houses, prices averaged $65 to $70 per ton. Lower prices on mechanical pulp as well as the announcement of the culmination of the Swedish lockout, it is believed, will have the moral effect at least of steadying board prices at their current quoted levels.

Mechanical Pulp

No. 1 prime spruce ground wood was quoted at $37 and $38 per ton at several Canadian shipping points during the past week, quotations being f. o. b. grinder. The current prices in New York receded slightly in consequence of the better water conditions at these production points and $1.40 per ton was generally accepted as the basis for transactions in this city. Ground wood men state that they are still far behind on contract commitments and in view of this fact they do not look for prices to fall off to any further extent.

Chemical Pulp

By far the most important news which has occurred in the chemical pulp market during the present year is that of the early part of this week telling of a complete settlement in the Swedish pulp lockout. It is estimated that nearly 200,000 tons of pulp already have been cut off from Sweden's annual production during the three months the strike has been in effect. Reserve stocks abroad have reached a low ebb and during the time that will be required to get back into full running order, considerable stiffening is expected to take place in pulp prices, both here and abroad. The market is very strong and demand for bleached sulphite and kraft pulp exceptionally vigorous.

Waste Paper

Conditions in the various waste paper markets last week reverted to those which obtained in early March. The undertone of the market was generally easy, buying was of a "hit-or-miss" type, and while the lower grades fell off noticeably in price, the better qualities stubbornly refused to be budged from their current listings. For the first time this year mixed papers fell below the dollar mark, being quoted at the average range of $.90 to $1.00 per cwt. Following Convention Week a resurrection of brisker activity is expected by dealers.

Old Rope and Bagging

Old rope held firm in price during the week, although collectors stated the consuming call was slightly below normal. No. 1 Domestic Manila was in heaviest demand by paper mills and was moderately active in its movement toward consuming channels.

Bagging continued to remain in more or less of a rut although there was a continuance of the humdrum demand which has existed for a month or more for No. 1 Scrap bagging by tissue paper mills. Prices were fairly steady.

Rags

Perhaps the strongest undertone of any of the paper stock markets was displayed in papermaking rag circles. Prices continued to advance and although this could not be attributed to any immediate buying stimulus, it was generally laid to the embargoes abroad, which are greatly curtailing the imports of European rags, and to the rapidly diminishing stocks in the hands of domestic collectors. The market is very firm and prices continue on the upward incline.

Twine

No changes of moment affected the twine market in the course of the week, though the consuming call in and around New York slackened up a bit during the Convention. Prices are steady and show a tendency to move toward higher levels, dealers say.

Market Quotations

Paper Company Securities

New York Stock Exchange closing quotations April 10, 1923:

	BID	ASKED
American Writing Paper Company pref.	28	29
International Paper Company, com.	50⅝	51
International Paper Company, pref., stamped	69¾	71
Union Bag & Paper Corporation	74¾	75

Paper

F. o. b. Mill.

Ledgers	11.00	@	38.00
Bonds	9.00	@	55.00
Writings—			
Extra Superfine	16.00	@	35.00
Superfine	14.00	@	30.00
Tub Sized	10.00	@	15.00
Engine Sized	8.50	@	11.00
News—f. o. b. Mill—			
Rolls, contract	3.80	@	3.95
Rolls, transit	4.00	@	4.25
Sheets	4.25	@	4.50
Side Runs	3.50	@	4.15
Book, Cased—f. o. b. Mill			
S. & S. C.	7.50	@	14.00
M. F.	7.00	@	10.00
Coated and Enamel	9 .00	@	14.00
Lithograph	9.00	@	14.00
Tissues—f. o. b. Mill			
White No. 1	.85	@	—
White No. 2	.80	@	—
Colored	1.10	@	—
Anti-Tarnish	1.40	@	—
Kraft	.90	@	.95
Manila	.80	@	—
Kraft—f. o. b. Mill—			
No. 1 Domestic	7.00	@	7.50
No. 2 Domestic	6.75	@	7.00
Imported	6.50	@	7.00
Screenings	3.25	@	3.50
Manila—			
No. 1 Jute	8.50	@	9.00
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.50	@	5.50
No. 2 Wood	4.00	@	4.50
Butchers	4.25	@	4.75
Fibre Papers—			
No. 1 Fibre	6.00	@	6.25,
No. 2 Fibre	5.25	@	5.50
Common Bogus	3.50	@	—
Card Middies	4.00	@	5.00
Boards—per ton—			
News	67.50	@	—
Straw	65.00	@	—
Chip	67.50	@	—
Binders' Board	85.00	@	—
Sgl. Mla.Ll. Chip	85.00	@	—
Wood Pulp	80.00	@	—
Container	87.50	@	—
Wax Paper—			
Self Sealing White 28 and 30 lb. basis	10.50	@	11.50
Waxed Tissue	1.50	@	1.60
Glassine—			
Bleached, basis 25 lbs.	15.00	@	16.00
Bleached, basis 20 lbs.	17.00	@	18.00
Papermakers' Felts per ton—			
Dry	75.00	@	85.00
Saturated	65.00	@	75.00
Sheathing Paper, per ton—			
Rosin Sized (red and gray, 30 lbs. per 500 sq. ft.)	55.00	@	65.00

Mechanical Pulp

(Ex-Dock)

No. 1 Imported	42.00	@	43.50

(F. o. b. Mill)

No. 1 Domestic	43.00	@	44.50
For immediate shipment	44.50	@	—

Chemical Pulp

(Ex-Dock, Atlantic Ports.)

Sulphite (Imported)—			
Bleached	4.60	@	5.10
Easy Bleaching	3.25	@	3.50
No. 1 strong unbleached	3.00	@	3.25
No. 2 Strong unbleached	2.85	@	3.10
No. 1 Kraft	3.00	@	3.25
Sulphate—			
Bleached	4.00	@	4.25

(F. o. b. Pulp Mill.)

Sulphite (Domestic)—			
Bleached	4.50	@	5.00
Strong unbl'chd	3.00	@	3.25
Easy Bleaching	3.00	@	3.50
News Sulphite	2.75	@	3.00
Mitscherlich	3.10		3.40
Kraft (Domestic)	3.00	@	3.25
Soda Bleached	4.25	@	4.50

Domestic Rags

New Prices to Mill, f. o. b. N. Y.

Shirt Cuttings—			
New White, No. 1	13.00	@	13.25
New White, No. 2	6.75	@	7.15
Silesias, No. 1	7.50	@	8.00
New Unbleached	9.50	@	10.00
Washables	4.50	@	5.00
Fancy	6.25	@	6.75
Cotton—acording to Grades—			
Blue Overall	6.75	@	7.25
New Blue	4.95	@	5.20
New Black Soft	5.00	@	5.50
New Light Seconds	2.90	@	3.15
O. D. Khaki Cuttings	4.25	@	4.75
Men's Corduroy	3.15	@	3.40
New Canvas	6.75	@	7.10
New Black Mixed	2.50	@	2.75
Old White, No. 1—			
Repacked	6.00	@	6.50
Miscellaneous	5.25	@	5.50
White, No. 2—			
Repacked	3.25	@	3.50
Miscellaneous	2.85	@	3.10
St. Soiled White	1.90	@	2.00
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.65	@	1.75
Black Stockings	2.90	@	3.25
Roofing Rags—			
Cloth Strippings	1.70	@	1.80
No. 1	1.70	@	1.80
No. 2	1.60	@	1.70
No. 3	1.20	@	1.30
No. 4	1.20	@	1.30
No. 5A	1.25	@	1.35

Foreign Rags

New Light Silesias	6.00		nominal
Light Flannelettes	6.75		nominal
Unbl'chd Cottons	7.50		nominal
New White Cuttings	9.50		nominal
New Light Oxfords	6.00		nominal
New Light Prints	4.50		nominal
New Mixed Cuttings	2.00	@	2.50
New Dark Cuttings	1.90	@	2.10
No. 1 White Linens	10.00		nominal
No. 2 White Linens	6.50		nominal
No. 3 White Linens	5.00		nominal
No. 4 White Linens	3.50		nominal
Old Extra Light Prints	2.00		nominal
Ord. Light Prints	1.75		nominal
Med. Light Prints	1.50		nominal
Dutch Blue Cottons	1.85		nominal
German Blue Cottons	1.65		nominal
Ger. Blue Linens	3.50		nominal
Checks and Blues	1.50		nominal
Dark Cottons	1.30	@	1.35
Shoppery	1.00	@	1.05
French Blues	1.75	@	2.00

Bagging

Prices to Mill F. o. b. N. Y.

Gunny No. 1—			
Foreign	1.00	@	1.10
Domestic	1.00	@	1.10
Wool, Tares, light	1.45	@	1.55
Wool, Tares, heavy	1.45	@	1.50
Bright Bagging	1.05	@	1.20
No. 1 Scrap	1.05	@	1.20
Sound Bagging	.85	@	.95
Manila Rope—			
Foreign	6.25	@	6.50
Domestic	6.50	@	6.75
New Bu. Cut	2.15	@	2.25
Hessian Jute Threads—			
Foreign	5.95	@	6.25
Domestic	2.20	@	2.40
Mixed Strings	.90	@	1.00

Twines

Cotton—(F. o. b. Mill)			
No. 1	.35	@	.37
No. 2	.31	@	.33
No. 3	.37	@	.39
India, No. 6 basis—			
Light	.20	@	.21
Dark	.19	@	.20
B. C., 18 basis	.41	@	.42
A. B. Italian, 18 Basis	.51	@	.61
Finished Jute—			
Dark, 18 basis	.29	@	.30
Light, 18 basis	.26	@	.27
Jute Wrapping, 3-6 Ply—			
No. 1	.23	@	.24
No. 2	.21	@	.22
Tube Rope—			
4-ply and larger	.15	@	.17
Fine Tube Yarn—			
5-ply and larger	.19	@	.21
4-ply	.20	@	.22
3-ply	.20	@	.22
Unfinished India—			
Basis	.16	@	.17
Paper Makers Twine			
Balls	.13	@	.15
Box Twine, 2-3 ply	.18	@	.19
Jute Rope	.17	@	.20
Amer. Hemp, 6	.33	@	.35
Sisal Hay Rope—			
No. 1 Basis	.15	@	.17
No. 2 Basis	.13	@	.15
Sisal Lath Yarn—			
No. 1	.14	@	.15
No. 2	.11	@	.13
Manila Rope	.18	@	.19

Old Waste Papers

(F. o. b. New York)

Shavings—			
Hard, White, No. 1	4.25	@	4.50
Hard, White, No. 2	3.75	@	4.00
Soft, White, No. 1	3.60	@	3.80
Flat Stock—			
Stitchless	2.50	@	2.60
Over Issue Mag.	2.50	@	2.60
Solid Flat Book	2.40	@	2.50
Crumpled No. 1	2.10	@	2.22
Solid Book Ledger	3.00	@	3.20
Ledger Stock	2.60	@	2.70
New B. B. Chips	1.10	@	1.20
Manilas—			
New Env. Cut	2.50	@	2.75
New Cut No. 1	2.00	@	2.25
Extra No. 1 Old	1.80	@	1.90
Print	1.45	@	1.55
Container Board	1.35	@	1.45
Bogus Wrapper	1.20	@	1.30
Old Krafts, machine compressed			
Bales	2.25	@	2.35
News—			
No. 1 White News	2.25	@	2.35
Strictly Overissue	1.50	@	1.60
Strictly Folded	1.25	@	1.35
No. 1 Mixed Paper	1.10	@	1.15
Common paper	.75	@	.85

CHICAGO

[FROM OUR REGULAR CORRESPONDENT.]

Paper

F. o. b. Mill

All Rag Bond	35	@	40
No. 1 Rag Bond	30	@	35
No. 2 Rag Bond	18	@	25
Water Marked Sulphite	10	@	14
Sulphite Bond	9	@	12
Sulphite Ledger	11	@	14
Superfine Writing	18	@	24
No. 1 Fine Writing	14	@	22
No. 2 Fine Writing	12	@	20
No. 3 Fine Writing	9	@	12
No. 1 M. F. Book	6½	@	7
No. 1 S. & S. C. Book	7	@	7½
Coated Book	9	@	10¼
Coated Label	9	@	10
News—Rolls mill	4	@	4½
News—Sheets, mill	4½	@	4¾
No. 1 Manila	4¾	@	6
No. 1 Fibre	5¼	@	5¾
No. 2 Manila	4½	@	5
Butchers' Manila	4	@	4½
No. 1 Kraft	7	@	7½
No. 2 Kraft	6½	@	7
Wood Tag Boards	5	@	5½
Screenings	5	@	5½
Boards, per ton—			
Plain Chip	60.00	@	65.00
Solid News	65.00		70.00
Manila Lined Chip	70.00	@	72.50
Container Lined—			
85 Test	75.00	@	80.00
100 Test	80.00	@	85.00

Old Papers

F. o. b. Chicago

Shavings—			
No. 1 Hard White	3.85	@	4.00
No. 1 Soft Shav.	3.70	@	3.85
No. 1 Mixed	1.80	@	1.90
No. 2 Mixed	1.70	@	1.80
White Envel. Cuttings	3.85	@	4.00
Ledgers and writings	2.50	@	2.60
Solid Books	2.50	@	2.60
No. 1 Books, Light	2.20	@	2.25
Blanks	2.25	@	2.50
Ex. No. 1 Manila	2.40	@	2.50
Manila Envelope Cuttings	2.65	@	2.80
No. 1 Manilas	1.90	@	2.00
Folders News (over issue)	1.75	@	1.80
Old Newspaper	1.40	@	1.50
Mixed Papers	1.40	@	1.50
Straw Clippings	1.40	@	1.50
Binders Clippings	1.40	@	1.50
Kraft	2.40	@	2.50
New Kraft Cuts	2.80	@	2.85
Roofing Stock, f. o. b. Chicago, Net Cash—			
No. 1	38.00	@	—
No. 2	36.00	@	—
No. 3	34.00	@	—
No. 4	34.00	@	—

PHILADELPHIA

[FROM OUR REGULAR CORRESPONDENT.]

Paper

Bonds	.10	@	.60
Ledgers	.15	@	.40
Writings—			
Superfine	.15	@	.20
Extra fine	.12	@	.22
Fine	.20	@	.30
Fine, No. 2	.20	@	.25
Fine, No. 3	.15	@	.20
Book, M. F.	.06	@	.11
Book, S. S. & C.	.08	@	.15
Book, Coated	.08	@	.15
Coated Lithograph	.10	@	.15
Label	.08	@	.15
News	.05	@	.07
No. 1 Jute Manila	.12	@	.13
Manila Sul., No. 1	.08	@	.10
Manila No. 2	.07½	@	.08
No. 2 Kraft	—	@	.10
No. 1 Kraft	—	@	.11
Common Bogus	.02½	@	.03
Straw Board	75.00	@	85.00
News Board	65.00	@	70.00
Chip Board	62.50	@	67.00
Wood Pulp Board	1.25	@	1.50

(Carload Lots)

Binder Boards—			
Per ton	75.00	@	80.00
Carload lots	75.00	@	80.00
Tarred Felts—			
Regular	48.00	@	50.00
Slaters	54.00	@	56.00
Best Tarred, 1-ply (per roll)	1.35	@	1.50
Best Tarred, 2-ply (per roll)	1.00	@	1.15
Best Tarred, 3-ply	1.50	@	1.65

Bagging

F. o. b. Phila.

Gunny No. 1—			
Foreign	1.25	@	
Domestic	1.20	@	1.25
Manila Rope	5.00	@	6.25
Sisal Rope	.75	@	.80
Mixed Rope	.75	@	.80
Scrap Burlaps	1.00	@	1.25
Wool Tares, heavy	2.50	@	2.75
Mixed Strings	.75	@	.80
No. 1, New Lt. Burlap	1.75	@	2.00
New Burlap Cuttings	1.75	@	2.10

Old Papers

F. o. b. Phila.

Shavings—			
No. 1, Hard White	4.00	@	4.25
No. 2, Hard White	3.50	@	3.75
No. 1 Soft White	3.60	@	3.75
No. 2 Soft White	2.00	@	2.25
No. 1 Mixed	1.60	@	1.75
No. 2 Mixed	1.25	@	1.50

(*Continued on page 386*)

Imports and Exports of Paper and Paper Stock

(*Continued from page* 381)

M. Friedman, by same, 133 bls. rags.
Corn Exchange Bank, by same, 124 bls. rags.
Castle & Overton, by same, 251 bls. rags.
American Wood Pulp Corp., by same, 863 bls. rags.
Reis & Co., by same, 47 bls. thread waste.
Phila. Nat'l Bank, by same, 98 bls. rags.
E. J. Keller Co., Inc., Sarcoxie, Bordeaux, 166 bls. rags.
E. J. Keller Co., Inc., Manch. Importer, Manchester, 104 bls. rags.
E. J. Keller Co., Inc., Ninian, Antwerp, 435 bls. flax waste.
E. J. Keller Co., Inc., by same, 585 bls. rags.
Castle & Overton, Nwestern Miller, London, 160 bls. waste paper.
Castle & Overton, Vde Djiboute, Marseilles, 413 bls. rags.
Coal & Iron Nat'l Bank, by same, 114 bls. rags.
Katzenstein & Keene, Inc., by same, 444 bls. rags.
Equitable Trust Co., by same, 80 bls. rags.
E. J. Keller Co., Inc., by same, 666 bls. rags.
Irving Bank, Columbia Trust Co., by same, 1,462 bls. rags.
Equitable Trust Co., by same, 210 bls. rags.
E. J. Keller Co., Inc., Norwich City, Hamburg, 167 bls. rags.
M. O'Meara Co., by same, 15 bls. rags.
Waste Material Trading Corp., by same, 98 bls. rags.
Katzenstein & Keene, Inc., by same, 233 bls. rags.
Ladenburg, Thalman & Co., by same, 376 bls. rags.
L. H. Abenheimer, by same, 36 bls. rags.
Castle & Overton, Schodack, Bordeaux, 358 bls. rags.
W. Schall & Co., by same, 190 bls. rags.
E. J. Keller Co., Inc., by same, 130 bls. rags.
Katzenstein & Keene, Inc., Anaconda, Antwerp, 375 bls. rags.
Salomon Bros. & Co., Schodack, Bordeaux, 59 coils old rope.

NEW ORLEANS IMPORTS

WEEK ENDING APRIL 7, 1923.

Castle & Overton, Carplaka, Belgium, 104 bls. bagging.
Castle & Overton, by same, 127 bls. rags.

THE NEW LaBOITEAUX ORGANIZATION

The news that Roger K. Rogan has purchased the interest of C. Louis LaBoiteaux in The C. L. LaBoiteaux Company, recently announced in the PAPER TRADE JOURNAL is received with interest by the box trade industry in general and by the many friends of both these gentlemen particularly.

Thirty years ago, C. L. LaBoiteaux decided to go into business for himself acting as sales agent for various boxboard and paper board mills. Previously, he had been in this business and had acquired a great deal of experience in the line. Gradually the business grew and in 1905 had attained such proportions that a company was formed and Roger K. Rogan became associated as a partner. This combination proved highly successful and remained together until this new development, which as stated, results in Mr. Rogan obtaining the chief interest in the concern.

In 1903 William Sicmon left the law offices of Ex-Governor Judson Harmon and entered the organization. Later he was made secretary and will be vice-president of the new company.

Since 1910, Chas. H. Upson has been connected with the La Boiteaux organization in various capacities which culminated in his being assistant general manager. Mr. Upson has been made treasurer of the new concern and will act as general manager also.

Harry G. Williams, another well-known member of the boxboard industry will be secretary of the new company and will operate from his present headquarters, Suite 1840 Transportation building, Chicago. Mr. Williams learned his trade under the guidance of George C. Coeny who is noted as one of the most experienced men in the industry.

The main office will of course have general charge of the affairs of The LaBoiteaux Company as hitherto. The Cincinnati organization has made a name for itself throughout the boxboard industry as being essentially progressive and untiring in its efforts. The visitor is impressed at once by the atmosphere of wide-awake business mingled with a genial good will which is reflected in the dealngs of the concern with its customers. This has been the policy since C. LaBoiteaux started the business and has been continued to this day.

In the Cincinnati office is found a good deal of mighty interesting timber which promises to develop into substantial additions to the boxboard trade. Henry LaBoiteaux has had his apprenticeship in the mills and on the road and is proving his resourcefulness and energy which have been passed on to him from his father. W. H. Ellis, H. A. Biedenharm, J. Hobart and others are also part of the headquarters organization who are proving their mettle.

In the Cleveland office, R. B. Williams keeps things humming. Bruce is acknowledged as one of the "live wires" of the trade and is living up to his reputation for being a hustler who gets what he goes after. Balfour Phelan is associated with Mr. Williams. A number of assistants will travel out of the Cleveland office in the near future so that this branch will undoubtedly be heard from even stronger than ever.

The New York office is in charge of John Barbara, who has been with the LaBoiteaux organization for almost ten years. He is in complete charge of the entire territory and is building up the LaBoiteaux forces in the East bigger than before. Donald Wyman and Robert A. Johnson are also in the New York branch. Both are well known to users of boxboard and are among the progressives who are writing history in the industry.

The St. Louis office, under Elliott Wilson, while comparatively new is a valuable link in the chain and is being heard from regularly.

Mention should also be made of Hilmar Mayer and H. A. Doody in the Chicago office. These men have met with decided success since joining this company.

The past thirty years have been eventful. From a one man concern the organization has grown and spread until it thoroughly covers the field. Its products are sold in every state in the Union as well as throughout Canada.

BEAUTIFICATION CAMPAIGN BY K. V. P.

An organized campaign of community beautification has been inaugurated at Parchment, home of the Kalamazoo Vegetable Parchment Company. It now covers practically every unit of activity in that prosperous village, and provides for participation by adults and youths and children alike.

A very extensive list of prizes has been hung up for all types of floral and vegetable gardening, the aggregate value being in excess of several hundreds of dollars.

The latest addition to the list of donors is the Parchment Men's Club, which has given $20 for the best kept yard in every respect; $10 for the best lawn; $10 for the best flower garden; $10 for the best vegetable garden. Other Parchment organizations have previously announced prizes, also divisions of the mill and concerns that distribute floral and vegetable seeds.

Applications for Parchment gardens are now pouring in and the next thirty days will see practically every boy in the community actively engaged tending his own plat of ground. Frank Southon, John Boldman and Walter Boylan have been named garden judges.

FIRE AT WESTERN BOARD CO. PLANT

Fire that did over $1,000 damage but was kept confined to the stock, occurred Friday at the plant of the Western Board and Paper Company. The firemen did good work in keeping the blaze down and saving any portion of the main mill structure from any damage whatever. Most of the loss, according to Manager Winship Hodge, was due to water and the fact that the stock will have to be handled immediately to save any greater loss.

Felt Test—Lowest Cost per Ton

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In the 32 grades of Felts and Jackets we can match your most exacting demands. Tell us the kind of paper you desire to make, and we will send you samples of felts that will economically serve you and help you to produce paper at lowest cost per ton.

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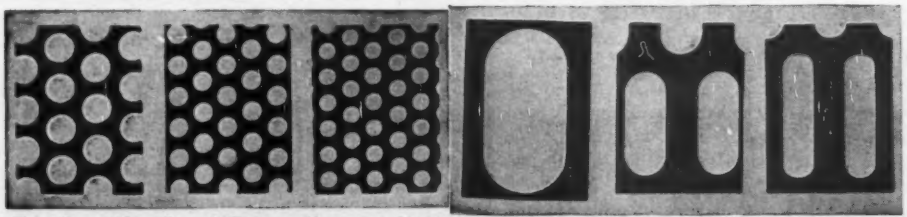

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Miscellaneous Markets

OFFICE OF THE PAPER TRADE JOURNAL.
TUESDAY, April 10, 1923.

BLEACHING POWDER.—The bleach market was practically without changes during the past week, consumers contracting readily for enough to meet their regular requirements and the prevailing quotations averaging 2.00 cents a pound being maintained.

BLANC FIXE.—Demand was consistently steady for both the dry blanc fixe and the blanc fixe pulp over the period; the former adhering to its quoted level of $85 to $90 per ton, and the latter ruling firm at $45 to $50 per ton. Makers state that the recent enlivenment in the paper industry has considerably stimulated consumption of this commodity.

CAUSTIC SODA.—Strength continues to be shown in the caustic market and consignments have been moving to consumers at the quoted figure of 2.50 cents a pound with uninterrupted regularity. Producers report that maximum production is already contracted for, for practically three-fourths of the current year. Stronger prices in the near future are indicated.

CASEIN.—There has been a slight advance in casein prices of late, the current quotations in the market being 21 and 22 cents a pound, duty paid by the purchaser. Imports from Argentina continue to come in increasing volume but dealers are still far behind on contract shipments.

LIQUID CHLORINE.—Owing to the fact that liquid chlorine is in exceptionally strong demand and supplies are none too plentiful, firmer prices would seem imminent in this market. At present the quotations range from 6.00 to 6.20 cents a pound, for 100 pound cylinders.

PAPERMAKERS' GLUE.—No alterations of consequence have entered into either demand or quotations on the various grades of hide glue used in tub sizing prices holding in the neighborhood of 13 to 19 cents a pound and the consuming call holding steady.

ROSIN.—Naval stores have shown a steady firming throughout the past week, rosin prices in particular advancing considerably. Grades E, F and G, packed in barrels of 280 pounds, are now quoted at 6.00 to 6.15 cents per pound, f. o. b. New York.

SALTCAKE.—Remaining in the vicinity of $26 per ton, the standard grades of saltcake have continued to show unusual activity and the market is nothing if not firm. Mills are absorbing large quantities of this chemical and the existing strong paper demand bodes well for a continuance of this activity.

SATIN WHITE.—No changes have entered into the satin white market since the last report and though regular quantities are finding their way into consuming channels, the price level varying from 1.50 to 2.00 cents a pound, according to the grade, has been consistently maintained.

SODA ASH.—The schedule price of 1.20 cents a pound is still the basis for the bulk of transactions in the soda ash market and together with other alkalies this chemical is firm.

STARCH.—No further price lowerings in the starch market under the slight drops which took place ten days ago were in evidence during the past week. The papermakers' grade of starch was held at 2.81 cents a pound in bag quantities and 3.09 cents in barrels. Powdered starch was listed at 2.71 and 2.99 cents a pound for these respective amounts.

SULPHATE OF ALUMINA.—Alum has continued unchanged at the prevailing quotation of 2.55 to 2.75 cents a pound for the iron free quality and 1.45 to 1.60 cents for commercial sulphate of alumina, with western quotations averaging 1.25 to 1.30 cents.

SULPHUR.—Good demand has held for sulphur during the week and the volume of business transacted is gradually increasing from month to month, according to producers. The present quoted price is $18 to $20 per ton, ex-dock, New York.

TALC.—American talc of good quality has not varied from its listing of $14 to $16 per ton and demand is regular.

Market Quotations

(Continued from page 383)

Solid Ledger Stock.	2.75	@	3.00
Writing Paper.....	2.50	@	2.75
No. 1 Books, heavy.	2.25	@	2.50
No. 2 Books, light.	1.40	@	1.50
No. 1 New Manila.	2.75	@	3.00
No. 1 Old Manila..	1.50	@	1.75
Container Manila...	1.35	@	1.50
Old Kraft.....	2.25	@	2.50
Overissue News....	1.50	@	1.60
Old Newspaper....	1.20	@	1.25
No. 1 Mixed Paper.	1.10	@	1.15
Common Paper.....	1.00	@	1.10
Straw Board, Chip.	1.00	@	1.10
Binders Bd., Chip..	1.00	@	1.10

Domestic Rags—New.
Price to Mill, f. o. b. Phila.

Shirt Cuttings—			
New White, No. 1	.12	@	.12¼
New White, No. 2	.07	@	
Silicias, No. 1....	.07¼	@	.07½
New unbleached..	.10	@	.11
Washables	.04½	@	
Fancy	.05¼	@	.05½
Cottons—according to grades—			
Blue Overall.....	.05½	@	.05¾
New Blue.....	.02¼	@	.02¾
New Black Soft..	.06¼	@	.06½
New Light Seconds	.02¾	@	.02¾
Khaki Cuttings...	.11	@	.04½
Corduroy	.03½	@	.04
New Canvass....	.08¼	@	.08¾
New Black Mixed Old	.04	@	
White, No. 1—			
Repacked	.06	@	.06½
Miscellaneous ...	.04½	@	.04¾
White, No. 2—			
Repacked	.03½	@	.04
Miscellaneous ...	.03	@	.03¼
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous ...	1.85	@	1.90
Black Stockings....	2.75	@	3.00
Roofing Stock—			
No. 1.....	1.35	@	1.40
No. 2.....	1.25	@	1.30
No. 3.....	1.15	@	1.20
No. 4.....	1.15	@	1.20
No. 5A	1.10	@	
B			nominal
C			nominal

BOSTON

[FROM OUR REGULAR CORRESPONDENT.]

Paper

Bonds	.09	@	.63
Ledgers	.09½	@	.55
Writings	.08½	@	.42
Superfine	.16	@	.26
Fine	.15	@	.18
Books, S. & S. C..	.07¼	@	.12
Books, M. F.	.06¾	@	.09½
Books, coated	.09	@	.15
Label	.09	@	.13
News, sheets	4.75	@	6.00
News, rolls	4.50	@	5.75
Manilas—			
No. 1 Manila....$6.00		@	7.00
No. 1 Fiber	.06½	@	.07
No. 1 Jute	9.00	@	10.50
Kraft Wrapping ..	.07	@	
Common Bogus ...	3.50	@	3.85

Boards

(Per Ton Destination)

Chip $60.00		@	65.00
News, Vat Lined..60.00		@	65.00
Wood, Vat Lined.$70.00		@	75.00
Filled News Board 60.00		@	65.00
Solid News Board. 75.00		@	80.00
S. Manila Chip... 75.00		@	80.00
Pat. Coated 90.00		@	100.00

Old Papers

Shavings—			
No. 1 Hard White	4.40	@	4.60
No. 1 Soft White	3.75	@	3.90
No. 1 Mixed.....	1.50	@	1.75
Ledgers & Writings	2.75	@	2.90
Solid Books	2.25	@	2.55
Blanks	1.70	@	1.80
No. 2 Light Books.	1.75	@	1.90
Folded News, overissues	1.25	@	1.30
Gunny Bagging....	1.50	@	1.75
Manila Rope.....	6.75	@	7.00
Common Paper	.75	@	.90
Old News	2.30	@	2.40
Old Kraft	1.90	@	2.00

TORONTO

[FROM OUR REGULAR CORRESPONDENT.]

Paper

(Mill Prices to Jobbers f. o. b. Mill)

Bond—			
Sulphite	.11	@	.12½
Light tinted.....	.12	@	.13½
Dark Tinted.....	.13½	@	.15
Ledgers (sulphite).	—	@	.13
Writing	.09½	@	.12
News, f. o. b. Mills—			
Rolls (carloads)..	3.75	@	—
Sheets (carloads)..	—	@	4.50
Sheets (2 tons or over)	—	@	4.75
Book—			
No. 1 M. F. (carloads)	9.00	@	—
No. 2 M. F. (carloads)	8.00	@	—
No. 3 M. F. (carloads)	7.50	@	—
No. 1 S. C. (carloads)	9.50	@	—
No. 2 S. C. (carloads)	8.50	@	—
No. 1 Coated and litho.	14.00	@	—
No. 2 Coated and litho	13.00	@	—
No. 3 Coated and litho.	12.25	@	—
Coated and litho., colored	14.25	@	—
Wrapping—			
Grey	5.00	@	—
White Wrap	5.75	@	—
"B" Manila.....	6.00	@	—
No. 1 Manila....	7.25	@	—
Fiber	7.25	@	—
Kraft, M. F.	8.00	@	—
M. G.	8.15	@	—

Pulp

(F. o. b. Mill)

Ground wood.....$35.00		@	38.00
Sulphite easy bleaching 70.00		@	75.00
Sulphite news grade.55.00		@	60.00
Sulphite, bleached..90.00		@	100.00
Sulphate 65.00		@	

Old Waste Papers

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut..	3.90	@	—
Soft White Book shavings	3.60	@	—
White Blk. News	2.20	@	—
Book and Ledger—			
Flat Magazine and Book Stock(old)	2.30	@	—
Light and Crumpled Book Stock	2.15	@	—
Ledgers and Writings	2.50	@	—
Solid Ledgers....	2.50	@	—
Manilas—			
New Manila Cut.	2.30	@	—
Printed Manilas..	1.85	@	—
Kraft	2.50	@	—
News and Scrap—			
Strictly Overissue	1.60	@	—
Folded News....	1.50	@	—
No. 1 Mixed Papers	1.20	@	—
Domestic Rags—			
Price to mills, f. o. b. Toronto			Per lb.
No. 1 White shirt cuttings	.13	@	.13½
No. 2 White shirt cuttings	.06½	@	.07
Fancy shirt cuttings	.06½	@	.06¾
No. 1 Old whites	.04½	@	.05
Third and blues.	.02¾	@	.03
			Per cwt.
Black stockings..	.03	@	—
Roofing stock:			
No. 1.....	—	@	—
No. 2	—	@	—
Roofing stock:			
Manila rope	.06½	@	.06¾
No. 2	1.55	@	—
Gunny bagging	.01¾	@	—